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ESSENTIALS OF ARITHMETIC GRADE II



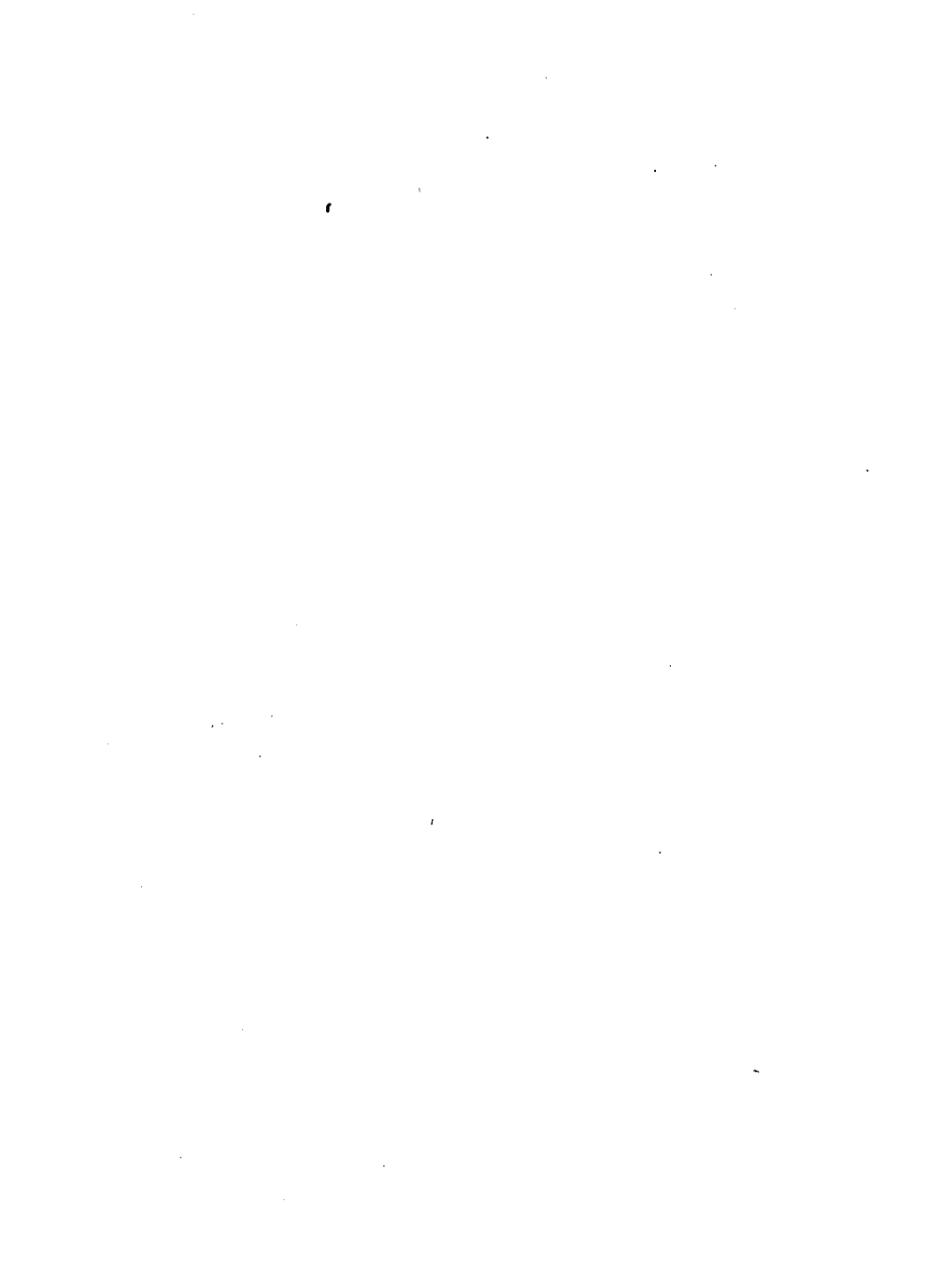
NINA B. GLASS

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° ESSENTIALS OF ARITHMETIC

GRADE II

BY

NINA B. GLASS



GINN AND COMPANY

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PREFACE

Much of the pupil's progress in arithmetic in the intermediate and upper grades depends upon the foundation which is acquired in the work of the primary grades. A well-developed and carefully graded textbook is therefore as helpful and as necessary in the teaching of this elementary number work as a primer in the teaching of reading.

To all teaching, and to none more than that of arithmetic, the following principles apply: (1) a necessary condition for learning is that the process be stimulated through motive and interest; (2) knowledge, to be real, must be founded upon natural experiences of the individual learner; and (3) knowledge, to be retained, must be given an opportunity for use. With these principles as a guide the development of each primary number fact in this book is presented in the following distinct phases: (1) the presentation, (2) the application, and (3) the drill upon the fact until the pupil has automatic control of it.

In the first phase, which forms the correct number concepts, the pupil is not asked to accept and learn printed facts, but is carefully shown how he can build these facts for himself. In the application, simple, everyday problems give to the pupil the wider appreciation of the meaning of the fact and the need for knowing it. While the problems also give drill in gaining control of the fact, it is

the third phase that gives the pupil the necessary automatic control, or forms the habit in regard to the fact. Great care has been taken in this work to develop a series of exercises and drills which possess greater variety and more careful gradation than most teachers can take time to work out for themselves, and which are of such a type as to show a need for the number facts and to furnish a stimulus to interest. In this grade games give the greatest stimulation to interest, — the natural result of which is concentration and attention, — but it has been the classroom experience of the author that with games the tendency is not to drill on all the combinations, but to concentrate on only a few. One feature of the book which counteracts this tendency is found in the three special drill charts (pages 29, 51, and 63), which develop all the primary addition facts by giving, first, those twenty-five combinations whose sums do not exceed ten; second, the forty-five separate combinations; and, third, those combinations with sums less than ten which are used in preparation for the addition of two-figure numbers.

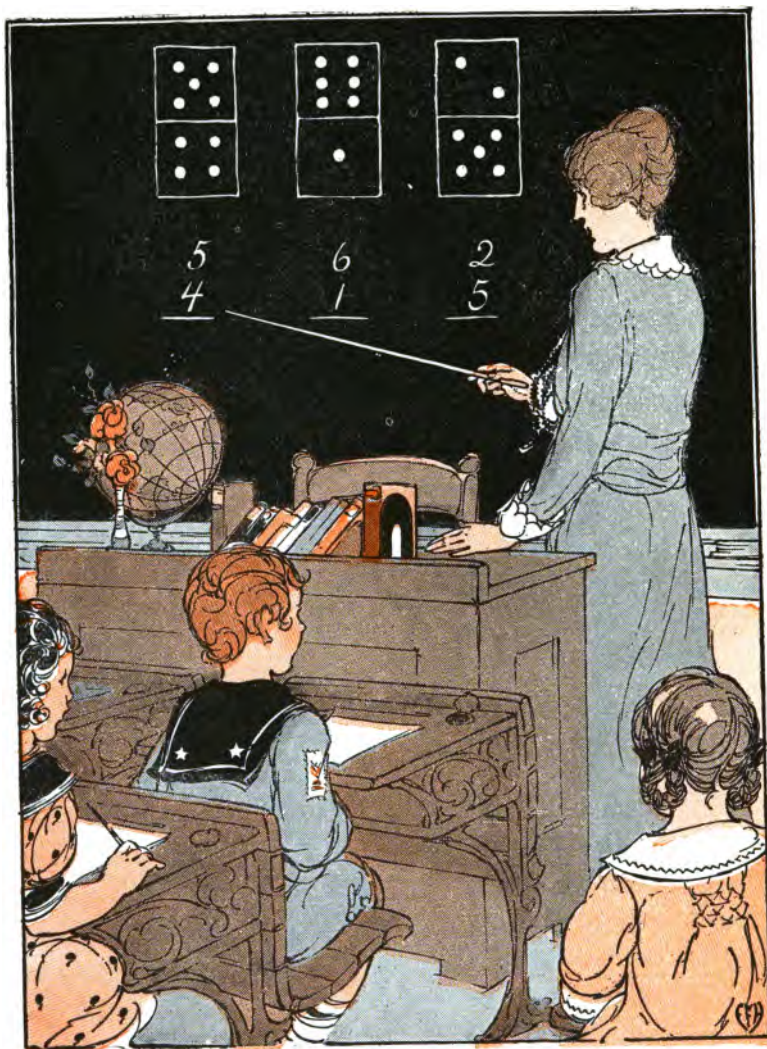
It is hoped that the book will make for economy of time and effort on the part of both teacher and pupil by giving that assistance which in the author's experience has been found necessary to develop in the pupil of this grade a well-balanced power and skill with numbers and to instill the habits of thoroughness, neatness, and accuracy.

NINA B. GLASS

WACO, TEXAS

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ESSENTIALS OF ARITHMETIC

GRADE II

CHAPTER I

THE FIRST TWENTY-FIVE NUMBER FACTS

COUNTING

1. Can you tell how many children there are in your class? Count them. How many are there?

2. How many boys are there in your class? How many girls are there?

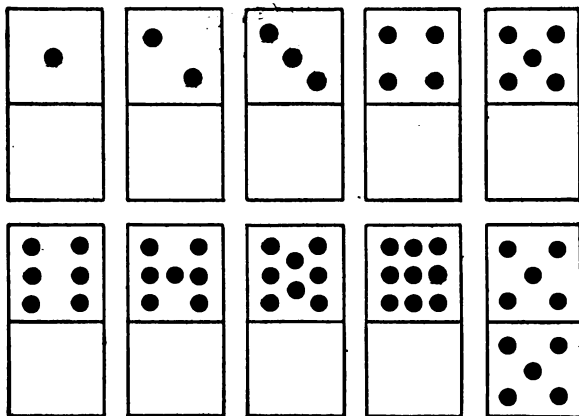
3. Count the number of desks in your classroom. How many are there?

4. How many readers will it take for the class if you give each child one book?

When the pupils can call the names of the numbers in proper order, the meaning of the names should then be taught by counting objects. Let the pupils count anything of which they are interested in finding the "how many."

READING NUMBERS

1. Tell how many dots on each of these cards:



2. Read:

1 is 1 one		6 is 6 ones	
2 is 2 ones		7 is 7 ones	
3 is 3 ones		8 is 8 ones	
4 is 4 ones		9 is 9 ones	
5 is 5 ones		10 is 10 ones	

In counting objects the teacher should exercise care that the pupils do not get the idea that the third one of a group is three, the fourth one four, and so on. By making the pupils repeat Ex. 2 often enough this difficulty may be overcome.

COUNTING AND BUILDING

1. Tell quickly how many splints you would need to build each of these objects:



Tent



Box



Coop



Table



Chair



House

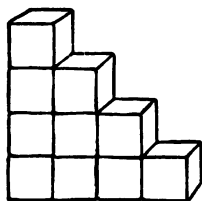


Boat

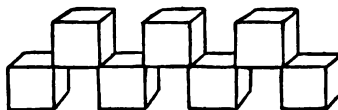


Fan

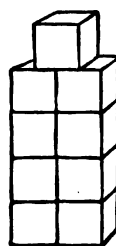
2. Tell how many blocks it will take to build each of these objects:



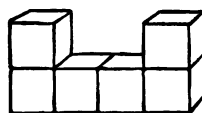
Stairs



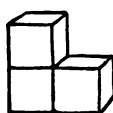
Bridge



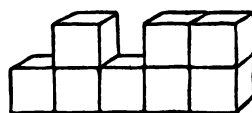
Tower



Bed



Chair



Engine

READING AND WRITING NUMBERS

Numbers tell how many. You can write numbers in either words or figures.

1. Here are the numbers from 1 to 12. Read them :

THINGS				
NAMES	one	two	three	four
FIGURES	1	2	3	4

THINGS				
NAMES	five	six	seven	eight
FIGURES	5	6	7	8

THINGS				
NAMES	nine	ten	eleven	twelve
FIGURES	9	10	11	12

2. Practice making these figures :

1 2 3 4 5 6 7 8 9 10

**ROTE OR RHYTHMIC COUNTING**

1. Read this Mother Goose rime:

One, two, three, four, five,
I caught a hare alive;
Six, seven, eight, nine, ten,
I let him go again.

2. Show your classmates:

5 pencils	4 books	10 pieces of crayon
3 pencils	8 books	9 pieces of crayon

3. Point to 6 objects in the room.
4. Select 7 children to stand up.
5. Count the desks in one row.

Daily practice in rote counting to 100 should be given.

APPLYING THE NUMBERS 1 TO 10*Read:*

1. There are 7 days in a week.
2. There are 5 school days in a week.
3. There are 6 work days in a week.
4. We have 1 day for rest in each week.
5. There are 2 days in each week that we do not go to school.
6. We go to school 9 months in a year.
7. There are 3 vacation months for school children.
8. There are 4 weeks in a month.
9. There are 8 weeks in two months.
10. We have 4 seasons in a year.
11. There are 3 months in each season.
12. There are 10 school days in two weeks.

Applications of the numbers like those above aid in helping the pupils to see the need for numbers. The pupils should prove the truth of these facts by naming and counting the days, weeks, months, and seasons.

NUMBER QUESTIONS

1. Are there three children in your family?
If not, how many are there?

2. Have you two boys in your family? If not,
how many are there?

3. How many girls are there in your family?

4. How many are there in your family, counting your mother, father, and all the children?

5. Do you live in a one-story or a two-story house?

6. Have you more than five rooms in your home?

7. Are there six rows of desks in your classroom?

8. Are there five seats in each row?

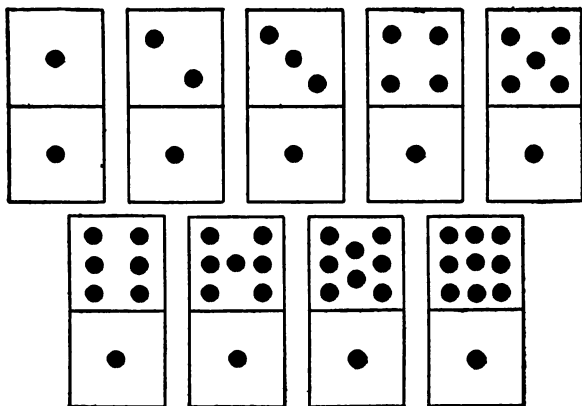
9. How many windows are there in your classroom?

Number questions like the above aid greatly in giving the pupils a clearer number concept.

ADDING 1

Adding 1 is just giving the next number in the order of counting.

1. Tell how many dots on each of these cards by saying the top number and adding 1 more:



2. Read and learn:

1	2	3	4	5	6	7	8	9
$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{7}$	$\frac{1}{8}$	$\frac{1}{9}$	$\frac{1}{10}$

3. Count backward from 1 to 10, saying:

10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

NUMBER PROBLEMS

1. How old are you? How old will you be in 1 year more? How old were you 1 year ago?

2. At her birthday party Mary had 1 candle on her birthday cake for each year of her age. This year her cake had 5 candles. How many will it have next year?

3. Ethel is 6 years old. In 1 year she will be old enough to go to school. How old will she be then?

4. On Frank's birthday his father gives him as many nickels as he is years old. On his last birthday his father gave him 8 nickels. How many nickels will Frank get on his next birthday?

5. Little Helen is 4 years old now. In 1 year she will be old enough to enter kindergarten. How old will she be then?

Daily practice with emphasis on the proper formation of the figures should be given in making the figures 1 to 10.

NUMBER STORIES

Read these number stories, filling in the blanks :

1. I have 9 cents in my bank and put in 1 cent more. I then have — cents in my bank.

2. I have 9 cents in my bank and take out 1 cent. I then have — cents left in my bank.

3. Baby slept 3 hours in the morning and 1 hour in the afternoon. In all Baby slept — hours.

4. There are 5 boys playing marbles, and 1 more comes into the game. There are then — boys playing marbles.

5. There were 7 little girls playing in the park, and 1 of them had to go home. There were then — girls left in the park.

6. John had 6 marbles, but lost 1 of them. He had only — marbles then.

Much practice should be given in making number stories which apply the number facts learned. The importance of problems in the beginner's number work is to give the pupil a clearer meaning of number facts and a feeling of the need for them. It makes for economy to teach the subtraction facts with the addition facts.

NUMBER DRILL

Add:

1.	2	4	5	6	9	3	8	7
	$\frac{1}{-}$	$\frac{1}{-}$	$\frac{1}{-}$	$\frac{1}{-}$	$\frac{1}{-}$	$\frac{1}{-}$	$\frac{1}{-}$	$\frac{1}{-}$
2.	1	1	1	1	1	1	1	1
	$\frac{8}{-}$	$\frac{4}{-}$	$\frac{7}{-}$	$\frac{5}{-}$	$\frac{9}{-}$	$\frac{6}{-}$	$\frac{3}{-}$	$\frac{2}{-}$

Tell the missing numbers:

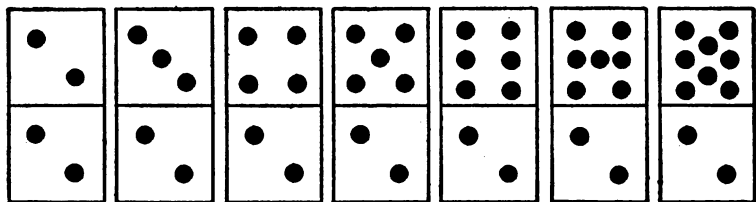
3.	1	1	1	5	*	1	*	1
	$\frac{*}{2}$	$\frac{*}{4}$	$\frac{*}{6}$	$\frac{*}{6}$	$\frac{1}{8}$	$\frac{*}{7}$	$\frac{1}{10}$	$\frac{*}{5}$
4.	1	1	*	*	1	1	*	*
	$\frac{*}{9}$	$\frac{*}{8}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{*}{10}$	$\frac{*}{3}$	$\frac{1}{4}$	$\frac{1}{7}$
5.	*	*	7	*	4	8	6	9
	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{*}{8}$	$\frac{1}{9}$	$\frac{*}{5}$	$\frac{*}{9}$	$\frac{*}{7}$	$\frac{*}{10}$

Supplying missing numbers prepares for the subtraction facts, which should first be learned from the addition facts and not as new facts. That is, in the example shown at the right, the pupil should see that from the number fact $3 + 1 = 4$, which he already knows, he can answer the question: What number added to the lower number makes the upper one?

4
$\frac{-1}{?}$

ADDING 2

1. Tell how many dots on each of these cards by saying the top number and adding 2 more:



2. Read and learn :

2	3	4	5	6	7	8
<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>
4	5	6	7	8	9	10

3. Touch the card that says 4; that says 8; that says 5; that says 10; that says 9.

4. What does the second card say? the third card? the last card? the middle card?

5. Add each of these two numbers, making one number of them :

[illegible]

NUMBER STORIES

Read these number stories, filling in the blanks :

1. James had 3 marbles and bought 2 more.
He then had — marbles.

2. Mary had 7 roses and picked 2 more.
Then she had — roses.

3. Martha cut 8 paper dolls from one piece
of paper and 2 dolls from another. She cut —
paper dolls from the two pieces.

4. When he was sick, John had to stay out
of school 2 days in one week and 2 days in
another week. He was out of school — days
in the two weeks.

5. Martha had 10 paper dolls yesterday, and
today she can find only 8 of them. She has lost
— of her dolls.

6. Dorothy asked 8 little girls to her birthday
party, but only 6 of them came. There were
— little girls who could not come.

COUNTING BY TWOS

1. Read the numbers in the black figures:

1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20

2. Count to 10 by 2's, saying 2, 4, 6, 8, 10.

3. Count 10 desks. Now count them by 2's.

4. Read this chart and learn to count to 50 by 2's:

2	4	6	8	10
12	14	16	18	20
22	24	26	28	30
32	34	36	38	40
42	44	46	48	50

5. Count the children in your class by 1's and then count them by 2's.

6. Count backward from 10 to 2, saying:

10, 8, 6, 4, 2.

MAKING NUMBER STORIES

1. Make a number story about:

5 guns and 2 guns

8 books and 2 books

3 beans and 2 beans

6 marbles and 2 marbles

4 balls and 2 balls

7 automobiles and 2 automobiles

2 trains and 2 trains

2. Make a number story about 3 and 2.

Make a number story about 7 and 2.

Make a number story about 6 and 2.

Make a number story about 8 and 2.

Make a number story about 5 and 2.

Make a number story about 4 and 2.

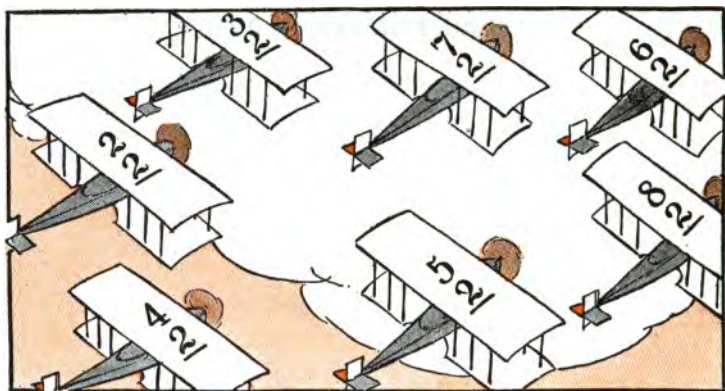
3. Using number facts that you know, make a number story about:

kites

airplanes

balloons

sailboats



THE AIRPLANE GAME

The airplanes are landed by naming the sums of the numbers on them.

1. You are a good flyer if you can land all the airplanes safely. Land them if you can.
2. See how quickly you can land all the airplanes.
3. Point to the airplanes whose numbers when added make :

9 8 10 5 7 6 4

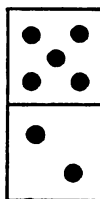
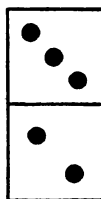
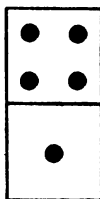
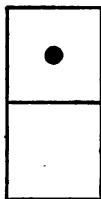
DOMINO-CARD REVIEW

The sign $+$ is read "and" or "plus."

The sign $=$ is read "is" or "equals."

The sign $-$ is read "less" or "minus."

1. Read, telling the missing numbers:



$1 + 0 = 1$

$4 + 1 = 5$

$3 + 2 = 5$

$5 + 2 = 7$

$0 + 1 = ?$

$1 + 4 = ?$

$2 + 3 = ?$

$2 + 5 = ?$

$1 - 0 = 1$

$5 - 4 = 1$

$5 - 2 = 3$

$7 - 2 = 5$

$5 - 1 = ?$

$5 - 3 = ?$

$7 - 5 = ?$

2. Make all the domino cards for the 1's and 2's. Tell everything that you can about the numbers on the cards.

The pupils should be taught to read the symbol 0 as "zero" and to understand that it means "not any." Unless the facts in connection with 0 are as carefully presented as the other number facts, 0 is likely to present to the pupils a real difficulty.

ADDING THREE NUMBERS

1. First add the dots on each of these cards and then add the figures:

	3
	2
 —	1 —

	1
	2
 —	2 —

	3
	2
 —	2 —

	4
	1
 —	2 —

2. Add these numbers:

3	1	3	4	5	6	8	7	4
2	2	2	1	2	2	1	2	2
1	2	2	2	2	1	1	1	2
—	—	—	—	—	—	—	—	—

3. How many are 1 apple, 2 apples, and 2 apples?

4. How many are 6 tops, 2 tops, and 2 tops?

5. John earned 5 nickels one day, 2 nickels the next day, and 1 nickel another day. How many nickels did he earn in the three days?

At first, in adding three numbers, the bottom number should be covered with a card until the sum of the first two numbers is called. Then the card should be removed in order to add the third number.

NUMBER DRILL

Add :

1.	2	2	4	2	2	2	2
	<u>2</u>	<u>6</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>1</u>	<u>7</u>
2.	1	3	5	1	8	1	1
	<u>2</u>	<u>1</u>	<u>1</u>	<u>6</u>	<u>1</u>	<u>7</u>	<u>4</u>
3.	5	2	3	8	7	6	2
	<u>2</u>	<u>4</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>8</u>

Tell the missing numbers :

4.	1	2	2	*	*	6	1
	<u>*</u>	<u>*</u>	<u>*</u>	<u>2</u>	<u>2</u>	<u>*</u>	<u>*</u>
	9	5	9	6	5	8	7
5.	*	*	1	2	*	*	2
	<u>1</u>	<u>2</u>	<u>*</u>	<u>*</u>	<u>2</u>	<u>2</u>	<u>*</u>
	8	7	3	4	9	8	10

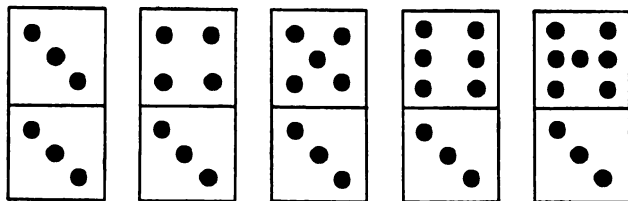
Subtract :

6.	5	6	7	4	8	9	3
	<u>-2</u>	<u>-2</u>	<u>-2</u>	<u>-2</u>	<u>-2</u>	<u>-2</u>	<u>-2</u>

These pages should be used as daily drills until all the facts can be given at sight or on hearing them called orally.

ADDING 3

1. Tell how many dots on each of these cards by saying the top number and adding 3 more:



2. Have 4 children stand. Let 3 more stand. Then count, saying 4, 5, 6, 7. How many children are there?

3. Let 5 girls stand. Let 3 more stand. Then count as before, beginning with 5. How many girls are there?

4. Let 7 boys stand. Let 3 more stand. Then count as before. How many boys are there?

5. Read and learn:

7	6	5	4	3	2	1
<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
10	9	8	7	6	5	4

NUMBER PROBLEMS

1. May and Nell had a doll party. May brought 4 dolls and Nell brought 3 dolls. How many dolls were at the party?

$$4 \text{ dolls} + 3 \text{ dolls} = ? \text{ dolls}$$

2. John had 8 marbles and lost all but 5 of them. How many marbles did he lose?

$$8 \text{ marbles} - 5 \text{ marbles} = ? \text{ marbles}$$

3. Tom found 6 eggs in one nest and 3 eggs in another. How many eggs were in both nests?

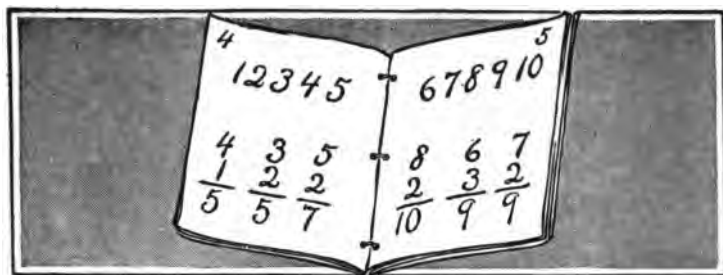
$$6 \text{ eggs} + 3 \text{ eggs} = ? \text{ eggs}$$

4. Walter had 8 rabbits and sold 3 of them. How many rabbits has he left?

$$8 \text{ rabbits} - 3 \text{ rabbits} = ? \text{ rabbits}$$

5. Nell set the table for her mother for their Thanksgiving dinner. There were 5 in the family and they were to have 3 guests. Nell set the table for how many persons?

$$5 \text{ persons} + 3 \text{ persons} = ? \text{ persons}$$



MAKING A NUMBER BOOK

1. Take ten sheets of large writing paper for the inside pages of your number book, and two sheets of drawing paper for the outside, or cover. Fasten the long edges of these sheets with paper clamps or tie them together.

2. Let the book be your "Number Fact Bank" and put into it in neat figures only those number facts which you have thoroughly learned.

3. Let each Friday be your deposit day.

The teacher can make these books very valuable to the pupils so that (1) they will stimulate interest in learning all the number facts and (2) they will create a desire to do neat work. Competition may be brought into this work by letting the pupils see which one can put the greatest number of facts in the book each week and also make the best figures.



ADDING 4

1. Beginning with the number 4, count four more, as 4, 5, 6, 7, 8.
2. Begin with the number 6 and count 4 more.
3. Begin with the number 5 and count 4 more.
4. Begin with the number 3 and count 4 more.
5. Read and learn :

4	5	6	3	2	1
$\frac{4}{8}$	$\frac{4}{9}$	$\frac{4}{10}$	$\frac{4}{7}$	$\frac{4}{6}$	$\frac{4}{5}$

6. Learn these subtraction facts :

$5 - 4 = 1$	$7 - 4 = 3$	$9 - 4 = 5$
$6 - 4 = 2$	$8 - 4 = 4$	$10 - 4 = 6$

NUMBER PROBLEMS

1. Mary and John planted a garden. Mary planted 2 rows of potatoes and John planted 4 rows of potatoes. How many rows did they both plant?

$$2 \text{ rows} + 4 \text{ rows} = ? \text{ rows}$$

2. John dug 5 hills in one of his rows and 4 hills in another. How many hills did he dig in the two rows?

$$5 \text{ hills} + 4 \text{ hills} = ? \text{ hills}$$

3. Mary invited 6 of her friends to see their garden, and John asked 4 of his friends. How many friends did they both ask?

$$6 \text{ friends} + 4 \text{ friends} = ? \text{ friends}$$

4. John dug 4 potatoes from under one vine and 4 potatoes from under another vine. How many potatoes did he get from both vines?

$$4 \text{ potatoes} + 4 \text{ potatoes} = ? \text{ potatoes}$$

The pupils should make similar number problems of their own.

SUBTRACTING 4

1. Read :

6	8	5	9	7	10	4
$\frac{-4}{2}$	$\frac{-4}{4}$	$\frac{-4}{1}$	$\frac{-4}{5}$	$\frac{-4}{3}$	$\frac{-4}{6}$	$\frac{-4}{0}$

2. Tell the missing numbers :

9	*	7	8	10	7	5	6
$\frac{-*}{5}$	$\frac{-4}{1}$	$\frac{-*}{3}$	$\frac{-4}{*}$	$\frac{-4}{*}$	$\frac{-4}{*}$	$\frac{-*}{1}$	$\frac{-4}{*}$

3. James and his brother Bill together had 6 rabbits. If 4 of them belong to James, how many belong to Bill?

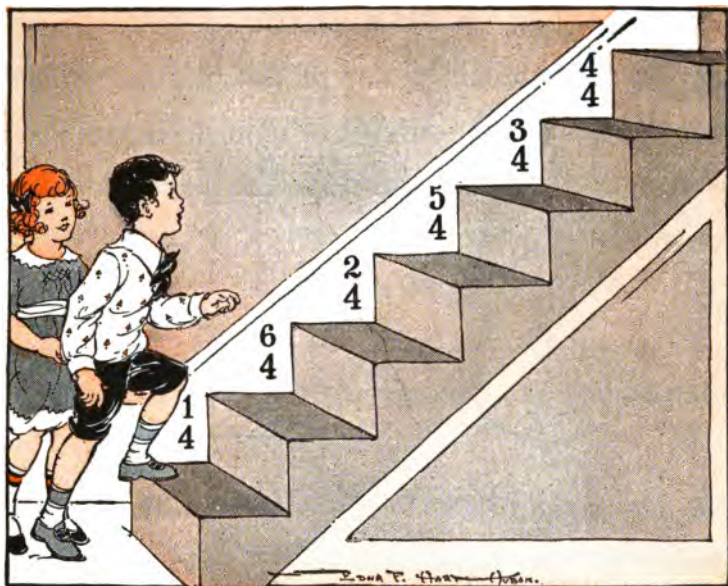
$$6 \text{ rabbits} - 4 \text{ rabbits} = ? \text{ rabbits}$$

4. Walter had 7 white mice, but when he went to feed them he could find only 4 of them. How many mice were gone?

$$7 \text{ mice} - 4 \text{ mice} = ? \text{ mice}$$

5. There were 9 boys playing ball, and 4 of them had to go home. How many boys were left?

$$9 \text{ boys} - 4 \text{ boys} = ? \text{ boys}$$



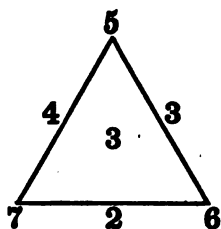
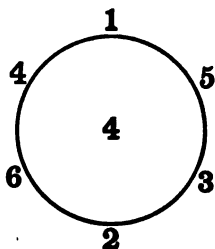
MOTION-PICTURE GAME

1. At the top of this stairway is a motion-picture show. Free admission is given to all children who can climb the stairway by adding correctly the figures on each step. See if you can get in free, beginning at the bottom step.

2. After the show you must descend the stairs in the same way, beginning at the top step.

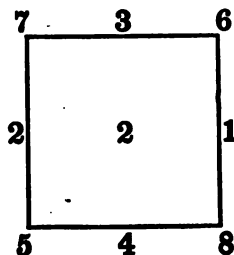
REVIEW GAMES

1. As the teacher or one of the pupils points to the numbers on the outside of this circle you are to run around the circle by adding 4 to each number :



2. Run around the triangle by adding 3 to each number on the outside.

3. Run around this square by adding 2 to each number at the corners and on the sides :



The figures for these games should be put on the blackboard and the numbers changed from time to time.

DRILL CHART I

$\frac{3}{\underline{4}}$	$\frac{3}{\underline{2}}$	$\frac{3}{\underline{3}}$	$\frac{3}{\underline{5}}$	$\frac{6}{\underline{3}}$	$\frac{1}{\underline{1}}$	$\frac{1}{\underline{2}}$
$\frac{4}{\underline{3}}$	$\frac{7}{\underline{1}}$	$\frac{2}{\underline{2}}$	$\frac{1}{\underline{9}}$	$\frac{2}{\underline{7}}$	$\frac{8}{\underline{1}}$	$\frac{3}{\underline{7}}$
$\frac{3}{\underline{1}}$	$\frac{5}{\underline{5}}$	$\frac{1}{\underline{5}}$	$\frac{4}{\underline{4}}$	$\frac{6}{\underline{2}}$	$\frac{2}{\underline{4}}$	$\frac{8}{\underline{2}}$
$\frac{5}{\underline{2}}$	$\frac{7}{\underline{2}}$	$\frac{2}{\underline{6}}$	$\frac{3}{\underline{6}}$	$\frac{6}{\underline{4}}$	$\frac{5}{\underline{4}}$	$\frac{4}{\underline{6}}$
$\frac{1}{\underline{6}}$	$\frac{5}{\underline{3}}$	$\frac{7}{\underline{3}}$	$\frac{4}{\underline{5}}$	$\frac{2}{\underline{8}}$	$\frac{2}{\underline{5}}$	$\frac{4}{\underline{1}}$
$\frac{*}{\underline{7}} \frac{7}{9}$	$\frac{3}{*} \frac{*}{\underline{9}}$	$\frac{4}{*} \frac{*}{\underline{9}}$	$\frac{3}{*} \frac{*}{\underline{8}}$	$\frac{4}{*} \frac{*}{\underline{7}}$	$\frac{*}{*} \frac{2}{\underline{6}}$	$\frac{*}{*} \frac{3}{\underline{5}}$

SUBTRACTION TABLE

$1 - 1 = 0$ $2 - 1 = 1$ $3 - 1 = 2$ $4 - 1 = 3$ $5 - 1 = 4$ $6 - 1 = 5$ $7 - 1 = 6$ $8 - 1 = 7$ $9 - 1 = 8$ $10 - 1 = 9$	$2 - 2 = 0$ $3 - 2 = 1$ $4 - 2 = 2$ $5 - 2 = 3$ $6 - 2 = 4$ $7 - 2 = 5$ $8 - 2 = 6$ $9 - 2 = 7$ $10 - 2 = 8$
$3 - 3 = 0$ $4 - 3 = 1$ $5 - 3 = 2$ $6 - 3 = 3$ $7 - 3 = 4$ $8 - 3 = 5$ $9 - 3 = 6$ $10 - 3 = 7$	$4 - 4 = 0$ $5 - 4 = 1$ $6 - 4 = 2$ $7 - 4 = 3$ $8 - 4 = 4$ $9 - 4 = 5$ $10 - 4 = 6$

The pupils are already familiar with all these number facts. There is, however, a great advantage in reviewing them and writing them in table form.

CHAPTER II

THE SECOND TWENTY NUMBER FACTS

BUILDING THE NUMBERS 10 TO 20

	$10 + 1 = 11$	eleven
	$10 + 2 = 12$	twelve
	$10 + 3 = 13$	thirteen
	$10 + 4 = 14$	fourteen
	$10 + 5 = 15$	fifteen
	$10 + 6 = 16$	sixteen
	$10 + 7 = 17$	seventeen
	$10 + 8 = 18$	eighteen
	$10 + 9 = 19$	nineteen
	$10 + 10 = 20$	twenty

1. If you have 1 ten and 1 one, you have 11.
With your splints show me 11.

2. Build the numbers 10 to 20 with splints.

ADDING NUMBERS TO 10

1. Tell what each of these numbers means:

14 15 18 13 12 11 17 19 16

2. Read:

10	10	10	10	10	10	10	10	10
$\frac{9}{19}$	$\frac{10}{20}$	$\frac{4}{14}$	$\frac{6}{16}$	$\frac{3}{13}$	$\frac{5}{15}$	$\frac{2}{12}$	$\frac{7}{17}$	$\frac{8}{18}$

3. Add downward:

7) 3)	6) 4)	8) 2)	9) 1)	5) 5)	1) 9)	2) 8)	4) 6)	3) 7)
<u>3</u>	<u>5</u>	<u>9</u>	<u>8</u>	<u>7</u>	<u>2</u>	<u>1</u>	<u>4</u>	<u>6</u>

4. Tell the missing numbers:

10	10	10	10	10	10	10	10	10
$\frac{*}{17}$	$\frac{*}{14}$	$\frac{*}{19}$	$\frac{*}{15}$	$\frac{*}{13}$	$\frac{*}{12}$	$\frac{*}{18}$	$\frac{*}{16}$	$\frac{*}{20}$

5. Count from 10 to 20.

6. Count backward from 20 to 10.

The pupil should be shown that, with the exception of eleven and twelve, the sounds of three and thirteen, four and fourteen, and so on, are so similar that by adding "teen," which means ten, to the order of counting that he already knows he can count from 10 to 19.

COUNTING BY TENS TO 100

1. Read :

1 ten = 10	ten
2 tens = 20	twenty
3 tens = 30	thirty
4 tens = 40	forty
5 tens = 50	fifty
6 tens = 60	sixty
7 tens = 70	seventy
8 tens = 80	eighty
9 tens = 90	ninety
10 tens = 100	one hundred

2. Count to 50 by 10's.

3. Read, learning to count by 10's to 100:

10 20 30 40 50 60 70 80 90 100

4. Count backward from 100 to 10, saying:

100 90 80 70 60 50 40 30 20 10

The teaching of the proper order and names of the tens can be readily accomplished by making use of the similarity of sounds in two and twenty, three and thirty, four and forty, and so on. In order to rationalize the counting by tens the pupils may count real or toy dimes.

COUNTING TO 100

1. Practice reading this chart, starting at 0 :

0	10	20	30	40	50	60	70	80	90
1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99

2. Find the number 50 in the chart. Now find page 50 in this book.

3. Find the number 67 in the chart. Now find page 67 in this book.

4. What is the next number after 49? after 29? after 19? after 69? after 39? after 59?

This chart helps to fix the order of the number scale and gives the pupils skill in finding page numbers in their readers, arithmetics, and so on. It may be used in counting by ones or by tens.

READING AND WRITING NUMBERS TO 100

1. Read and write :

20	40	16	9	99
30	90	26	18	77
22	80	36	14	33
63	86	46	19	55
74	7	56	10	44
8	89	66	13	88
65	17	76	15	11

2. Read and write as one number :

$20 + 2$	$30 + 4$	$50 + 7$	$10 + 1$
$60 + 4$	$90 + 8$	$10 + 0$	$20 + 1$
$70 + 6$	$20 + 7$	$10 + 2$	$30 + 1$
$50 + 5$	$10 + 3$	$80 + 3$	$40 + 1$
$10 + 7$	$30 + 2$	$80 + 5$	$60 + 1$

3. Write in figures :

eleven	thirty-one	ninety-five
ten	twenty-four	eighty-one
fifteen	forty-five	fifty-four
fourteen	sixty-two	seventy-five

ADDING 6 AND 7

1. Read and learn :

5	6	7	4	5	6	7
$\frac{6}{11}$	$\frac{6}{12}$	$\frac{6}{13}$	$\frac{7}{11}$	$\frac{7}{12}$	$\frac{7}{13}$	$\frac{7}{14}$

2. Add :

5	6	4	7	3	7	5	6	4
$\frac{6}{6}$	$\frac{6}{6}$	$\frac{6}{6}$	$\frac{6}{6}$	$\frac{6}{6}$	$\frac{7}{7}$	$\frac{7}{7}$	$\frac{7}{7}$	$\frac{7}{7}$

3. Tell the missing numbers :

6	*	*	6	7	5	7	7	6
$\frac{*}{12}$	$\frac{6}{13}$	$\frac{6}{10}$	$\frac{*}{11}$	$\frac{*}{14}$	$\frac{*}{12}$	$\frac{*}{13}$	$\frac{*}{12}$	$\frac{*}{13}$

4. Add :

5	6	6	7	7	7	4
$\frac{6}{6}$	$\frac{7}{7}$	$\frac{6}{6}$	$\frac{6}{6}$	$\frac{7}{7}$	$\frac{5}{5}$	$\frac{7}{7}$
5	6	6	7	7	7	4
5) 1	4) 3	4) 2	3) 3	4) 3	4) 1	5) 2

Developing the sum of these number combinations through counting does not greatly aid the pupil in remembering the facts, but it gives him another application of the meaning of addition.

NUMBER PROBLEMS

1. Our flag has 7 red stripes and 6 white ones. How many stripes are there in all?

$$7 \text{ stripes} + 6 \text{ stripes} = ? \text{ stripes}$$

2. On Washington's birthday the boys brought 5 flags to decorate the room and the girls brought 6 flags. How many flags did they both bring?

$$5 \text{ flags} + 6 \text{ flags} = ? \text{ flags}$$

3. In a number drill there were 6 boys and 6 girls. How many children were in the drill?

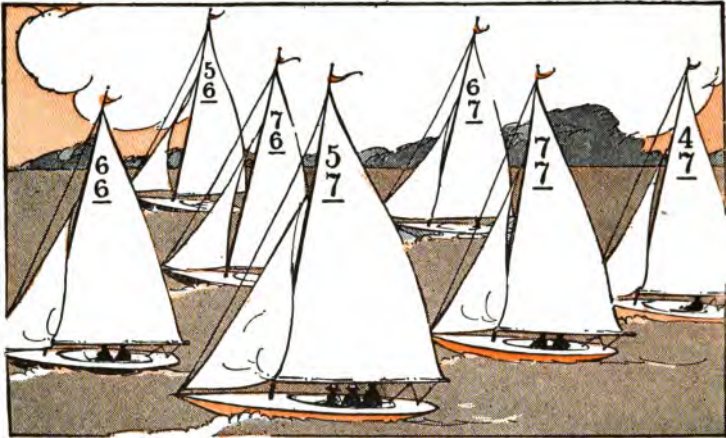
$$6 \text{ children} + 6 \text{ children} = ? \text{ children}$$

4. In a marching drill 4 of the girls and 7 of the boys wore soldier caps. How many caps were there in all?

$$4 \text{ caps} + 7 \text{ caps} = ? \text{ caps}$$

5. Louise cut out 5 hatchets on Washington's birthday and Helen cut out 7 hatchets. How many hatchets did they both cut out?

$$5 \text{ hatchets} + 7 \text{ hatchets} = ? \text{ hatchets}$$



THE SAILBOAT GAME

The boats are sailed by naming the sums of the numbers on the sails.

1. You are a good sailor if you can sail all the boats. Sail these boats if you can.
2. Touch the sails whose numbers make 13.
3. Touch the sails whose numbers make 12.
4. Touch the sail whose numbers make 14.
5. Touch the sails whose numbers make 11.

NUMBER DRILL

Add :

1.	6	6	5	6	7	4	5	7
	5	6	6	3	7	7	7	4
	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
2.	7	7	7	6	6	7	4	0
	6	5	0	0	7	3	6	7
	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
3.	2)	3)	3)	2)	3)	6)	3)	2)
	3	3	4	2	3	1	4	5
	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	6	6	6	7	7	7	5	4
	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Tell the missing numbers :

4.	*	*	*	7	*	7	*	*
	6	7	6	*	7	*	6	7
	<u>12</u>	<u>13</u>	<u>11</u>	<u>11</u>	<u>14</u>	<u>12</u>	<u>10</u>	<u>10</u>
5.	12	14	11	13	12	10	10	13
	<u>-*</u>	<u>-*</u>	<u>-*</u>	<u>-*</u>	<u>-*</u>	<u>-*</u>	<u>-*</u>	<u>-*</u>
	6	7	5	7	7	7	6	6

Subtract :

6.	12	13	11	11	14	12	10	10
	<u>-6</u>	<u>-7</u>	<u>-6</u>	<u>-7</u>	<u>-7</u>	<u>-7</u>	<u>-6</u>	<u>-7</u>

ADDING 8

1. Add :

10	10	10	10	10	10
<u>4</u>	<u>3</u>	<u>6</u>	<u>2</u>	<u>5</u>	<u>1</u>

2. Read :

8 + 6 is the same as 10 + 4.

8 + 5 is the same as 10 + 3.

8 + 8 is the same as 10 + 6.

8 + 4 is the same as 10 + 2.

8 + 7 is the same as 10 + 5.

8 + 3 is the same as 10 + 1.

3. Read and learn :

8	8	8	8	8	8	8
<u>6</u>	<u>5</u>	<u>8</u>	<u>4</u>	<u>3</u>	<u>7</u>	<u>2</u>
14	13	16	12	11	15	10

In groups of things larger than 10 the use of objects does not make the meaning of the addition clearer, nor does it help the pupil to remember the number facts. The pupil, however, knows the meaning of "teen"; that is, that 15 means 10 and 5. Hence the aim of this method of developing the number facts in connection with the addition of 8 is to show that in adding a number to 8 the number of the "teen" is 2 less than the number added; that is, 8 + 7 is the same as 10 + 5, and hence 8 + 7 = 15.

NUMBER PROBLEMS

1. There are 8 oak trees and 3 elm trees in the school yard. How many trees are there in all?

$$8 \text{ trees} + 3 \text{ trees} = ? \text{ trees}$$

2. There were 8 boys playing marbles and 4 more joined them. How many boys were then playing?

$$8 \text{ boys} + 4 \text{ boys} = ? \text{ boys}$$

3. Sam's father has 8 white pigs and 5 black ones. How many pigs has he in all?

$$8 \text{ pigs} + 5 \text{ pigs} = ? \text{ pigs}$$

4. Harry sold 8 papers in the morning and 6 papers in the afternoon. How many more papers did he sell in the morning?

$$8 \text{ papers} - 6 \text{ papers} = ? \text{ papers}$$

5. Fred sold 8 papers in one office building and 5 papers in another. How many more papers did he sell in the first building?

$$8 \text{ papers} - 5 \text{ papers} = ? \text{ papers}$$

ADDING 9

1. Read :

9 + 6 is the same as 10 + 5.

9 + 5 is the same as 10 + 4.

9 + 8 is the same as 10 + 7.

9 + 9 is the same as 10 + 8.

9 + 4 is the same as 10 + 3.

9 + 2 is the same as 10 + 1.

9 + 3 is the same as 10 + 2.

9 + 7 is the same as 10 + 6.

2. Read and learn :

9	9	9	9	9	9	9	9
6	4	5	8	9	7	3	2
<u>15</u>	<u>13</u>	<u>14</u>	<u>17</u>	<u>18</u>	<u>16</u>	<u>12</u>	<u>11</u>

3. Tell the missing numbers :

9	9	9	9	9	9	9	9
*	*	*	*	*	*	*	*
<u>11</u>	<u>15</u>	<u>18</u>	<u>12</u>	<u>14</u>	<u>17</u>	<u>16</u>	<u>13</u>

The method of developing the number facts in connection with adding 9 is explained on page 40. In this case the number of the "teen" is 1 less than the number added.

NUMBER PROBLEMS

1. How many flags are 9 flags and 1 flag?
2. How many pens are 9 pens and 7 pens?
3. How many blocks are 9 blocks and 6 blocks?

4. How many desks are 9 desks and 8 desks?
5. How many chairs are 9 chairs and 5 chairs?
6. How many ships are 9 ships and 2 ships?
7. There are 9 children standing and 4 more stand up. How many children are then standing?
 $9 \text{ children} + 4 \text{ children} = ? \text{ children}$

8. There are 9 boys on one baseball team and 9 boys on the opposing team. How many boys are there on both teams?

$$9 \text{ boys} + 9 \text{ boys} = ? \text{ boys}$$

9. There are 9 books on the shelf and I put 3 more books beside them. How many books are there on the shelf then?

$$9 \text{ books} + 3 \text{ books} = ? \text{ books}$$

NUMBER STORIES

Read these number stories, filling in the blanks :

1. There are 16 children at a party, and 9 of them have been served with ice cream. There are — more children to be served.

$$16 - 9 = ?$$

2. There are 12 blocks between Nell's house and the school. When she has walked 9 blocks she has — blocks to walk.

$$12 - 9 = ?$$

3. A newsboy had 15 magazines and he sold 9 of them. He still had — magazines to sell.

$$15 - 9 = ?$$

4. There were 17 airplanes flying and 9 of them landed. There were — airplanes still flying.

$$17 - 9 = ?$$

5. There were 14 birds on a telephone wire and 9 of them flew away. There were — birds left on the wire.

$$14 - 9 = ?$$

NUMBER DRILL

Add:

1.	9	9	9	8	8	8	9	8	9
	<u>6</u>	<u>5</u>	<u>8</u>	<u>6</u>	<u>8</u>	<u>4</u>	<u>4</u>	<u>9</u>	<u>3</u>
2.	6	5	9	9	4	3	8	7	6
	<u>9</u>	<u>9</u>	<u>7</u>	<u>2</u>	<u>9</u>	<u>9</u>	<u>3</u>	<u>9</u>	<u>8</u>
3.	4	7	8	9	9	8	8	5	8
	<u>8</u>	<u>8</u>	<u>5</u>	<u>0</u>	<u>9</u>	<u>7</u>	<u>2</u>	<u>8</u>	<u>0</u>
4.	5)	2)	8)	3)	4)	3)	4)	5)	6)
	<u>4</u>	<u>7</u>	<u>1</u>	<u>6</u>	<u>5</u>	<u>1</u>	<u>4</u>	<u>3</u>	<u>2</u>
	<u>6</u>	<u>5</u>	<u>7</u>	<u>4</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>7</u>	<u>8</u>

Tell the missing numbers:

5.	9	8	9	8	*	9	9	8	9
	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>8</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>
	<u>15</u>	<u>14</u>	<u>17</u>	<u>15</u>	<u>11</u>	<u>12</u>	<u>18</u>	<u>17</u>	<u>13</u>
6.	8	9	8	9	*	*	*	*	8
	<u>*</u>	<u>*</u>	<u>*</u>	<u>*</u>	<u>8</u>	<u>8</u>	<u>9</u>	<u>8</u>	<u>*</u>
	<u>13</u>	<u>11</u>	<u>11</u>	<u>16</u>	<u>15</u>	<u>12</u>	<u>14</u>	<u>13</u>	<u>16</u>

These pages should be used as daily drills until the facts can be recalled automatically. The facts should also be applied in concrete terms, as 9 books + 6 books = 15 books, and so on.

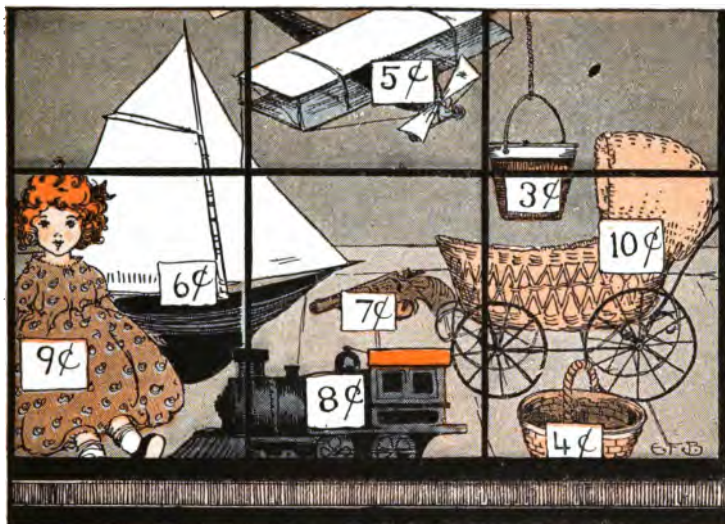
BUYING SCHOOL SUPPLIES

Pencils	7¢	Drawing pencils	6¢
Box of crayolas	9¢	Pencil tablets	7¢
Bottle of ink	10¢	Language tablets	8¢
Rulers	4¢	Pencil boxes	5¢
Ink pens	2¢	Book covers	3¢
Ink tablets	10¢	Spelling tablets	7¢
Erasers	5¢	Penholders	5¢

Tell what it costs if you buy:

1. A pencil and a box of crayolas.
2. A bottle of ink and a book cover.
3. An eraser and a spelling tablet.
4. A drawing pencil and a box of crayolas.
5. A language tablet and a spelling tablet.
6. A book cover, a ruler, and an eraser.
7. A bottle of ink and an ink tablet.
8. Select any two things that you need and tell the cost of them.

The teacher should explain informally the use of the sign ¢.



PLAYING STORE

1. Tell how much it costs to buy :
 - A sailboat and a basket.
 - An engine and a doll.
 - A pail and a doll.
 - A doll carriage and a sailboat.
 - A pistol and an airplane.
2. Name two toys that you can buy for 10¢.
3. Select any two toys and tell what they cost.

SUBTRACTION DRILL

Subtract :

1.	4	9	3	12	5	8	5	4	6	6
	<u>2</u>	<u>8</u>	<u>2</u>	<u>6</u>	<u>1</u>	<u>4</u>	<u>4</u>	<u>3</u>	<u>4</u>	<u>1</u>
	4	10	7	8	9	6	3	7	6	10
	<u>1</u>	<u>5</u>	<u>1</u>	<u>7</u>	<u>1</u>	<u>3</u>	<u>1</u>	<u>6</u>	<u>5</u>	<u>1</u>
2.	5	11	10	11	7	18	8	10	14	10
	<u>3</u>	<u>7</u>	<u>8</u>	<u>6</u>	<u>4</u>	<u>9</u>	<u>6</u>	<u>2</u>	<u>7</u>	<u>4</u>
	9	8	8	10	9	6	9	8	7	16
	<u>4</u>	<u>1</u>	<u>5</u>	<u>9</u>	<u>2</u>	<u>2</u>	<u>7</u>	<u>2</u>	<u>3</u>	<u>8</u>
	7	11	10	5	9	10	7	10	8	12
	<u>2</u>	<u>5</u>	<u>7</u>	<u>2</u>	<u>5</u>	<u>3</u>	<u>5</u>	<u>6</u>	<u>3</u>	<u>8</u>
3.	12	14	11	12	9	13	11	15	9	16
	<u>4</u>	<u>6</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>9</u>	<u>9</u>	<u>6</u>	<u>7</u>
	14	12	15	12	16	12	13	11	13	13
	<u>9</u>	<u>5</u>	<u>7</u>	<u>9</u>	<u>9</u>	<u>7</u>	<u>8</u>	<u>3</u>	<u>6</u>	<u>9</u>
	13	11	13	17	15	11	15	14	17	14
	<u>5</u>	<u>2</u>	<u>7</u>	<u>8</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>9</u>	<u>5</u>

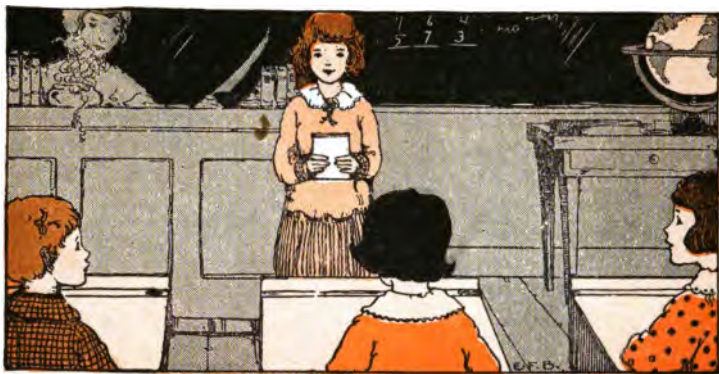
5-3	11-8	10-8	12-6
9-5	12-7	14-7	6-2
10-3	11-4	16-9	16-8
9-7	12-3	15-6	13-9
8-5	13-8	14-9	17-9
10-6	15-8	11-5	14-8
9-3	13-7	12-8	18-9
7-2	11-9	8-6	7-4

SUBTRACTION LADDERS

To fall off the ladders is to give an incorrect answer to the examples on them.

1. Climb these ladders as rapidly as you can, beginning at the bottom and subtracting the numbers as you go up. See if you can climb all the ladders without falling off.

2. See if you can climb down all the ladders without falling off, beginning at the top.



NUMBER-CARD GAME

1. Helen has the forty-five addition cards that you have been using in your drills. She holds the cards so that the class cannot see the numbers and says: "I am looking at two numbers which make 8. One of the numbers is 3. What is the other number?" Can you tell her?

2. See if you can fill these blanks:

Two numbers make 9. One is 5; the other is —.

Two numbers make 13. One is 9; the other is —.

Two numbers make 17. One is 9; the other is —.

Two numbers make 15. One is 8; the other is —.

DRILL CHART II

1 <u>1</u>	1 <u>2</u>	2 <u>2</u>	1 <u>3</u>	2 <u>3</u>	1 <u>4</u>	3 <u>3</u>	2 <u>4</u>	3 <u>4</u>
5 <u>1</u>	5 <u>2</u>	4 <u>4</u>	1 <u>6</u>	5 <u>4</u>	2 <u>6</u>	1 <u>7</u>	2 <u>7</u>	1 <u>8</u>
3 <u>6</u>	5 <u>5</u>	1 <u>9</u>	4 <u>6</u>	2 <u>9</u>	4 <u>8</u>	5 <u>7</u>	5 <u>3</u>	8 <u>8</u>
5 <u>6</u>	4 <u>7</u>	5 <u>9</u>	9 <u>9</u>	8 <u>9</u>	6 <u>8</u>	6 <u>7</u>	7 <u>9</u>	4 <u>9</u>
3 <u>7</u>	3 <u>8</u>	6 <u>6</u>	3 <u>9</u>	6 <u>9</u>	7 <u>7</u>	5 <u>8</u>	2 <u>8</u>	7 <u>8</u>

The chart on page 29 gives the combinations which constitute the first group of the addition facts; that is, those twenty-five combinations whose sums do not exceed 10. This chart gives all the separate combinations that make up the forty-five primary number facts in addition. This page should be reviewed frequently (at least once a week) until all the combinations can be given instantly.

ADDITION TABLE

$0 + 2 = 2$	$0 + 3 = 3$	$0 + 4 = 4$	$0 + 5 = 5$
$1 + 2 = 3$	$1 + 3 = 4$	$1 + 4 = 5$	$1 + 5 = 6$
$2 + 2 = 4$	$2 + 3 = 5$	$2 + 4 = 6$	$2 + 5 = 7$
$3 + 2 = 5$	$3 + 3 = 6$	$3 + 4 = 7$	$3 + 5 = 8$
$4 + 2 = 6$	$4 + 3 = 7$	$4 + 4 = 8$	$4 + 5 = 9$
$5 + 2 = 7$	$5 + 3 = 8$	$5 + 4 = 9$	$5 + 5 = 10$
$6 + 2 = 8$	$6 + 3 = 9$	$6 + 4 = 10$	$6 + 5 = 11$
$7 + 2 = 9$	$7 + 3 = 10$	$7 + 4 = 11$	$7 + 5 = 12$
$8 + 2 = 10$	$8 + 3 = 11$	$8 + 4 = 12$	$8 + 5 = 13$
$9 + 2 = 11$	$9 + 3 = 12$	$9 + 4 = 13$	$9 + 5 = 14$
$10 + 2 = 12$	$10 + 3 = 13$	$10 + 4 = 14$	$10 + 5 = 15$
$0 + 6 = 6$	$0 + 7 = 7$	$0 + 8 = 8$	$0 + 9 = 9$
$1 + 6 = 7$	$1 + 7 = 8$	$1 + 8 = 9$	$1 + 9 = 10$
$2 + 6 = 8$	$2 + 7 = 9$	$2 + 8 = 10$	$2 + 9 = 11$
$3 + 6 = 9$	$3 + 7 = 10$	$3 + 8 = 11$	$3 + 9 = 12$
$4 + 6 = 10$	$4 + 7 = 11$	$4 + 8 = 12$	$4 + 9 = 13$
$5 + 6 = 11$	$5 + 7 = 12$	$5 + 8 = 13$	$5 + 9 = 14$
$6 + 6 = 12$	$6 + 7 = 13$	$6 + 8 = 14$	$6 + 9 = 15$
$7 + 6 = 13$	$7 + 7 = 14$	$7 + 8 = 15$	$7 + 9 = 16$
$8 + 6 = 14$	$8 + 7 = 15$	$8 + 8 = 16$	$8 + 9 = 17$
$9 + 6 = 15$	$9 + 7 = 16$	$9 + 8 = 17$	$9 + 9 = 18$
$10 + 6 = 16$	$10 + 7 = 17$	$10 + 8 = 18$	$10 + 9 = 19$

CHAPTER III

NUMBERS TO 1000

READING AND WRITING NUMBERS

Read :

1. Here is 1 ten, or 10. 10 tens make 1 hundred, which we write like this: 100.



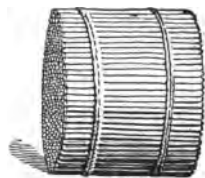
2. In this picture there are 3 hundreds. We write 3 hundred like this: 300.



3. The hundreds are written like this:

100 200 300 400 500 600 700 800 900

4. The largest number of three figures is 999. The next number after 999 is 1 thousand, which we write like this: 1000.



5. In this large bundle there are 10 hundred splints, or 1000 splints.

READING AND WRITING NUMBERS**1. Read and write in figures :**

1 hundred	4 hundred
5 hundred	2 hundred
6 hundred	9 hundred
3 hundred	7 hundred

2. Read :

One hundred one is written 101.

One hundred two is written 102.

One hundred ten is written 110.

One hundred twenty is written 120.

One hundred twenty-one is written 121.

3. Read and write as single numbers :

$100 + 1$	$100 + 10$	$100 + 20$
$100 + 6$	$100 + 15$	$100 + 90$

4. Read :

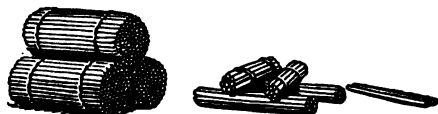
370	260	860	908	811
250	570	440	801	620
450	320	780	709	915

In reading whole numbers "and" should not be used.

READING AND WRITING NUMBERS

1. Read :

We write $300 + 40 + 2$ like this: 342.



In this picture there are 342 splints.

We write $200 + 20 + 1$ like this: 221.

We write $500 + 70 + 3$ like this: 573.

We write $900 + 90 + 9$ like this: 999.

2. Read and write as single numbers :

$$300 + 20 + 4$$

$$600 + 80 + 6$$

$$400 + 70 + 1$$

$$800 + 90 + 9$$

$$100 + 50 + 5$$

$$200 + 40 + 1$$

$$900 + 10 + 1$$

$$100 + 20 + 1$$

3. Read :

375

562

346

423

404

270

267

482

734

607

185

864

969

521

704

163

125

744

242

110

NUMBER STORIES

Read these number stories :

1. There are 365 days in a year.
2. There are 100 cents in a dollar.
3. There are 52 weeks in a year.
4. The second-grade reader had 128 pages.
5. The postman delivered 200 letters in a day.
6. My father drove 145 miles.
7. The ranchman sold 295 head of sheep.
8. The farmer bought 350 acres of land.
9. There were 945 trees in the park.
10. The ladies hid 325 Easter eggs in the park.
11. One Saturday the children gathered 255 daisies and 273 violets.
12. There are 558 children in a school. There are 228 girls and 330 boys.

The reading of large numbers may be related to the school attendance, to house and telephone numbers, and to anything of interest in which large numbers are applied. Each pupil should know his house and telephone number.

PLACE VALUE OF FIGURES

The first figure on the right is called the *ones' figure*, the next is called the *tens' figure*, and the next is called the *hundreds' figure*.

1. Read, telling how many hundreds, tens, and ones, as 1 hundred, 2 tens, 1 one. Then read as a single number, as 121:

Hundreds
Tens
Ones

1 2 1

3 1 5

5 0 6

Hundreds
Tens
Ones

1 7 2

7 6 3

5 4 8

Hundreds
Tens
Ones

1 0 1

2 0 3

4 0 8

Hundreds
Tens
Ones

2 0 0

3 0 5

6 2 1

2. Write in figures:

9 hundreds 3 tens 0 ones

6 hundreds 0 tens 0 ones

2 hundreds 0 tens 8 ones

4 hundreds 1 ten 8 ones

It is better to give the work in number reading on the previous pages before attempting to teach place value.

READING NUMBERS

1. Read :

100	140	243	503
300	113	107	207
209	118	204	644
708	289	516	123
275	366	807	908
37	75	42	555

2. Read and write as single numbers :

$200 + 50 + 8$	$600 + 80 + 8$
$500 + 20 + 1$	$700 + 60 + 9$
$700 + 60 + 5$	$800 + 50 + 7$
$100 + 10 + 1$	$900 + 70 + 6$
$100 + 30 + 6$	$900 + 20 + 3$
$300 + 60 + 3$	$400 + 40 + 4$

3. Write in figures :

2 hundred	37	3 hundred	90
1 hundred	35	6 hundred	66
4 hundred	99	7 hundred	67
6 hundred	11	8 hundred	21
9 hundred	89	1 hundred	30

REVIEW NUMBER DRILL

Add :

1.	8	7	9	8	6	9	9
	<u>6</u>	<u>5</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>6</u>
2.	7	6	5	5	9	6	3
	<u>4</u>	<u>6</u>	<u>9</u>	<u>5</u>	<u>9</u>	<u>5</u>	<u>4</u>
3.	6	7	9	3	4	3	3
	<u>4</u>	<u>2</u>	<u>2</u>	<u>5</u>	<u>8</u>	<u>7</u>	<u>6</u>
4.	8	5	2	4	5	2	4
	<u>2</u>	<u>8</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>3</u>	<u>9</u>
5.	7	3	9	8	8	2	6
	<u>7</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>8</u>	<u>5</u>	<u>2</u>

Subtract :

6.	13	11	15	9	14	13	17
	<u>-5</u>	<u>-6</u>	<u>-7</u>	<u>-3</u>	<u>-9</u>	<u>-4</u>	<u>-8</u>
7.	12	15	16	14	9	13	18
	<u>-7</u>	<u>-9</u>	<u>-9</u>	<u>-6</u>	<u>-4</u>	<u>-6</u>	<u>-9</u>

The daily use of number drills and flash cards makes it more certain that all combinations are given than when games are played. From five to ten minutes daily should be given to this type of drill.

ADDING BY ENDINGS

Add:

1.	1	11	21	31	41	51	61
	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{1}{22}$	$\frac{1}{\quad}$	$\frac{1}{\quad}$	$\frac{1}{\quad}$	$\frac{1}{\quad}$

2.	1	11	21	31	71	81	91
	$\frac{2}{3}$	$\frac{2}{13}$	$\frac{2}{\quad}$	$\frac{2}{\quad}$	$\frac{2}{\quad}$	$\frac{2}{\quad}$	$\frac{2}{\quad}$

3.	1	11	21	31	61	71	81
	$\frac{3}{4}$	$\frac{3}{\quad}$	$\frac{3}{\quad}$	$\frac{3}{\quad}$	$\frac{3}{\quad}$	$\frac{3}{\quad}$	$\frac{3}{\quad}$

4.	1	11	21	51	71	81	91
	$\frac{4}{5}$	$\frac{4}{\quad}$	$\frac{4}{\quad}$	$\frac{4}{\quad}$	$\frac{4}{\quad}$	$\frac{4}{\quad}$	$\frac{4}{\quad}$

5.	1	11	31	51	61	71	81
	$\frac{5}{6}$	$\frac{5}{\quad}$	$\frac{5}{\quad}$	$\frac{5}{\quad}$	$\frac{5}{\quad}$	$\frac{5}{\quad}$	$\frac{5}{\quad}$

Before pupils can add a column of figures that requires adding to numbers exceeding 10, as $12 + 3$, they should be drilled on adding a one-figure number to a two-figure number. To do this with skill, they must see that the sums *end* the same as in the forty-five combinations; thus, $12 + 5$ ends in 7, the sum of $2 + 5$.

ADDING BY ENDINGS

Add:

1.	2	12	22	32	42	52	62
	2	2	2	2	2	2	2
	<u>4</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>

2.	2	12	22	32	42	82	92
	3	3	3	3	3	3	3
	<u>5</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>

3.	2	12	42	52	72	82	92
	4	4	4	4	4	4	4
	<u>6</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>

4.	2	12	22	32	42	52	62
	5	5	5	5	5	5	5
	<u>7</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>

5.	2	12	42	52	62	72	82
	6	6	6	6	6	6	6
	<u>8</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>6</u>

6.	2	12	22	62	72	82	92
	7	7	7	7	7	7	7
	<u>9</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>

This type of drill may also be used with subtraction.

DRILL CHART III

13 <u>6</u>	43 <u>6</u>	14 <u>4</u>	54 <u>4</u>	11 <u>8</u>	81 <u>8</u>
13 <u>4</u>	63 <u>4</u>	23 <u>5</u>	53 <u>5</u>	42 <u>2</u>	62 <u>2</u>
31 <u>5</u>	81 <u>5</u>	12 <u>6</u>	32 <u>6</u>	22 <u>5</u>	72 <u>5</u>
32 <u>7</u>	62 <u>7</u>	21 <u>6</u>	41 <u>6</u>	32 <u>4</u>	92 <u>4</u>
12 <u>3</u>	62 <u>3</u>	31 <u>3</u>	41 <u>3</u>	21 <u>7</u>	81 <u>7</u>
24 <u>5</u>	64 <u>5</u>	43 <u>3</u>	63 <u>3</u>	41 <u>4</u>	71 <u>4</u>

ADDING BY ENDINGS

Add:

1.	2	12	22	32	42	52	62	72
	8	8	8	8	8	8	8	8
	<u>10</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>

2.	7	17	27	57	1	11	31	81
	3	3	3	3	9	9	9	9
	<u>10</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>10</u>	<u>9</u>	<u>9</u>	<u>9</u>

3.	5	15	35	65	4	14	34	44
	5	5	5	5	6	6	6	6
	<u>10</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>10</u>	<u>6</u>	<u>6</u>	<u>6</u>

4.	3	13	23	43	4	14	34	54
	8	8	8	8	7	7	7	7
	<u>11</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>11</u>	<u>7</u>	<u>7</u>	<u>7</u>

5.	5	15	25	75	2	12	32	52
	6	6	6	6	9	9	9	9
	<u>11</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>11</u>	<u>9</u>	<u>9</u>	<u>9</u>

The second group of endings involves those combinations in which the sum of the one-figure number and the right-hand digit of the two-figure number is 10 or greater. In this work there should be no formal carrying, the pupils being taught to observe the endings and to notice that the tens' figure is thereby increased by 1.

ADDING BY ENDINGS

Add:

1.	6	16	26	36	3	13	23	33
	<u>6</u>	<u>6</u>	<u>6</u>	<u>6</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>
	12				12			

2.	4	14	44	64	5	15	35	75
	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>
	12				12			

3.	5	15	25	45	4	14	54	74
	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>
	13				13			

4.	5	15	55	85	7	17	27	67
	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>
	14				14			

5.	8	18	38	68	8	18	38	58
	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>
	15				16			

6.	8	18	48	68	9	19	39	49
	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>
	17				18			

ADDING SINGLE COLUMNS

Add:

1.	6	7	8	9	8	6
12	6	5	4	13	4	7
<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>
2.	5	8	9	5	7	9
12	7	4	3	13	8	4
<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>5</u>	<u>5</u>	<u>5</u>
3.	5	4	8	6	7	9
11	6	7	3	14	8	5
<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>	<u>3</u>	<u>3</u>	<u>3</u>
4.	6	2	3	8	7	4
4	9	8	4	3	3	2
<u>4</u>	<u>5</u>	<u>2</u>	<u>3</u>	<u>2</u>	<u>5</u>	<u>9</u>
5.	6	7	8	7	6	2
3	2	1	1	5	5	3
4	5	3	5	4	4	8
<u>2</u>	<u>4</u>	<u>2</u>	<u>6</u>	<u>3</u>	<u>7</u>	<u>1</u>

In adding the columns, all except the first two numbers at the top should be covered. When the sum of the first two numbers is given, the next number is uncovered and the sum given, and so on.



BEAN-BAG GAME

Find the score for each game and tell who won :

1.

May	4	0	5	2	0
Tom	3	0	0	4	3

4.

May	2	7	3	0	0
Tom	3	0	9	3	4

2.

May	2	9	4	0	2
Tom	7	5	4	0	3

5.

May	2	0	9	7	0
Tom	7	4	0	3	3

3.

May	3	5	4	0	7
Tom	0	3	7	5	2

6.

May	3	2	7	3	2
Tom	3	9	3	0	2

ADDING NUMBERS OF TWO FIGURES

1. Frank counted 24 apples in one basket and 14 apples in another. How many apples were there in both baskets?

$$4 \text{ ones} + 4 \text{ ones} = 8 \text{ ones}$$

$$1 \text{ ten} + 2 \text{ tens} = 3 \text{ tens}$$

$$3 \text{ tens} + 8 \text{ ones} = 38$$

24

14

38

There were 38 apples in both baskets.

2. One box has 30 oranges in it and another has 24 oranges. How many oranges are there in both boxes?

$$4 \text{ ones} + 0 \text{ ones} = 4 \text{ ones}$$

$$2 \text{ tens} + 3 \text{ tens} = 5 \text{ tens}$$

$$5 \text{ tens} + 4 \text{ ones} = 54$$

30

24

54

There are 54 oranges in both boxes.

3. There are 25 children in one class and 34 children in another. How many children are there in both classes?

No carrying is introduced in this development of the addition of two-figure numbers.

ADDING NUMBERS OF TWO FIGURES

Write and add :

1.	31	30	23	24	15
	24	34	31	12	32
	<u>12</u>	<u>21</u>	<u>24</u>	<u>13</u>	<u>12</u>
2.	42	36	32	36	22
	34	21	17	40	35
	<u>21</u>	<u>42</u>	<u>30</u>	<u>23</u>	<u>12</u>
3.	31	30	32	38	16
	14	25	16	20	43
	<u>23</u>	<u>43</u>	<u>30</u>	<u>41</u>	<u>20</u>
4.	23	42	26	24	33
	33	32	53	24	32
	<u>43</u>	<u>22</u>	<u>20</u>	<u>51</u>	<u>24</u>
5.	24	32	11	37	44
	12	13	24	20	12
	<u>62</u>	<u>14</u>	<u>33</u>	<u>12</u>	<u>31</u>

In these examples the sum of the three numbers in either the ones' or tens' place does not exceed 9. After adding the columns upward, the pupils should add downward as a check.

SUBTRACTING TWO-FIGURE NUMBERS

1. Frank has 48 cents, and spends 25 cents for a knife. How many cents does he have left?

$$8 \text{ ones} - 5 \text{ ones} = 3 \text{ ones}$$

$$4 \text{ tens} - 2 \text{ tens} = 2 \text{ tens}$$

$$2 \text{ tens} + 3 \text{ ones} = 23$$

Frank has 23 cents left.

48
- 25
—
23

2. There are 36 pupils in the second grade, and 21 of them are girls. How many boys are there in the second grade?

$$6 \text{ ones} - 1 \text{ one} = 5 \text{ ones}$$

$$3 \text{ tens} - 2 \text{ tens} = 1 \text{ ten}$$

$$1 \text{ ten} + 5 \text{ ones} = 15$$

There are 15 boys in the second grade.

36
- 21
—
15

3. Write and subtract:

64	84	69	58	36	58	76
- 13	- 32	- 18	- 12	- 24	- 21	- 45
—	—	—	—	—	—	—
64	89	48	36	64	27	27
- 76	- 37	- 16	- 14	- 41	- 15	- 12
—	—	—	—	—	—	—

**NUMBER PROBLEMS**

1. There were 26 boys and 23 girls on a picnic outing. How many children were at the picnic?

$$26 + 23 = ?$$

2. The children saw 15 gray squirrels and 13 red ones. How many squirrels did they see in all?

$$15 + 13 = ?$$

3. Before lunch 15 boys and 14 girls played hide-and-seek. How many children played?

$$15 + 14 = ?$$

4. In the woods where the children ate their lunch they counted 32 pine trees and 24 oaks. How many trees did they count in all?

$$32 + 24 = ?$$

COUNTING BY FIVES

1. How many fingers have you on one hand?
2. How many fingers have you on both hands?
3. How much is $5 + 5 + 5$?
4. Count by 5's from 5 to 25, saying:

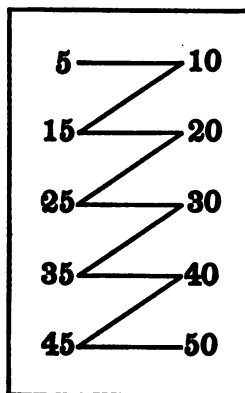
5, 10, 15, 20, 25.

5. Which is easier, to count the fingers of 5 children one finger at a time or to count the fingers by 5's?

6. Let us play the game of Zigzag 5's. Begin at 5 and run along the line, naming the number at each corner. Run from 5 to 50.

7. Count backward by 5's from 50 to 5.

8. Count by 5's from 5 to 100.



In telling the minutes before and after the hour, and in counting money, the pupils will find it useful to know how to count by fives.

CHAPTER IV

MEASURES AND FRACTIONS

TELLING TIME

Read :

1. We see these numbers on the clock face :

I = 1	IV or IIII = 4	VII = 7	X = 10
II = 2	V = 5	VIII = 8	XI = 11
III = 3	VI = 6	IX = 9	XII = 12

2. These numbers are called Roman numerals.

Read them on this clock.

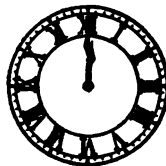
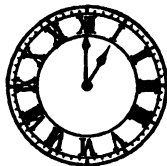
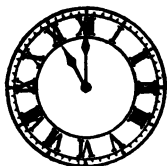
3. The long hand on the clock is called the minute hand. This hand moves all the way round the clock face in one hour.



4. The short hand on the clock is called the hour hand. This hand moves from one number to the next in one hour.

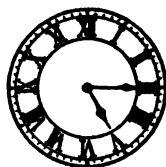
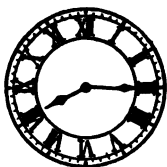
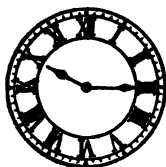
TELLING TIME

1. What time does each of these clocks tell?



Each of these clocks tells the exact hour.

2. Count the minutes by 5's around these clock faces.



Each of these clocks tells you that it is a quarter, or 15 minutes, past the hour.

3. Read and learn :

60 minutes = 1 hour

60 min. = 1 hr.

24 hours = 1 day

24 hr. = 1 da.

TIME QUESTIONS

1. At what time do you get up in the morning?
2. At what time do you go to bed at night?
3. At what time does school begin?
4. At what time does your class have the morning recess?
5. How many minutes do you have for recess?
6. At what time do you have lunch?
7. How many minutes do you have for lunch?
8. At what time is school dismissed?
9. How many hours do you spend in school each day?
10. How many minutes does it take you to walk from your home to school each morning?
11. How many hours of sleep should every child have each night?

The work in telling time may be made more real by asking the pupils the time at different intervals during the day. To give the pupils a notion of time they should stand for five seconds, rest for a minute, and so on.

INDEFINITE COMPARISONS

1. Who is the smallest girl in your room?
Who is the smallest boy in your room?

2. Have the tallest girl in your class stand.
Have the tallest boy in your class stand.

3. Which is wider, your desk or your teacher's desk?

4. Are some streets wider than others?

5. Which is nearer to your desk, a door or a window?

6. Which is higher, the doors or the windows in your classroom?

7. Which is longer, your pencil or your ruler?

8. Which is longer, the width or the length of this book?

The purpose of this work in indefinite comparisons is to lead the pupils to feel a need for accurate work in making comparisons. They then see that accuracy of comparison calls for measurements of some type. The children should be taught the size concepts, as large, small; big, little; and so on. They should also be taught the form and direction concepts, as circle, square, oblong; up, down; over, under; and so on.

INCHES, FEET, AND YARDS

We use inches, feet, and yards in measuring.

1. Read and learn :

12 inches = 1 foot

3 feet = 1 yard

12 in. = 1 ft.

3 ft. = 1 yd.

2. This line is 1 inch long:



Show me 1 inch on your ruler.

3. This line is 2 inches long:



Show me 2 inches on your ruler.

4. With your ruler draw a line 2 inches long on the blackboard.

5. Without your ruler draw a line 3 inches long. Measure it.

Work in measuring means little unless the children actually do it themselves. They should estimate short lengths and then test the accuracy of their estimates by using the ruler. The idea of greater and less enters into all measurement work, and the teacher should emphasize this notion of comparison.

INCHES, FEET, AND YARDS

We measure a length less than 1 foot in inches.

1. Is your reader less than a foot wide? Measure it.

2. Do you see anything in your room that you think is 1 foot long? Measure it.

We measure things like cloth in yards and inches.

3. With your foot rule draw a line 3 feet long.

4. What is a line that is 3 feet long called?

We measure how tall we are in feet and inches.

5. How tall are you? Let one of your classmates measure your height.

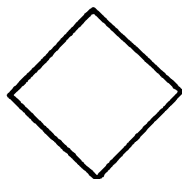


FIGURE 1



FIGURE 2



FIGURE 3

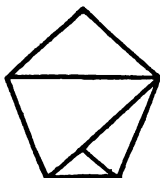


FIGURE 4 (Enlarged)



FIGURE 5 (Enlarged)

MAKING A DRINKING CUP

1. Cut out an 8-inch square of white paper as shown in Figure 1.
2. Fold the square as shown in Figure 2.
3. Fold the lower right-hand corner to touch the opposite side as shown in Figure 3.
4. Fold the lower left-hand corner in the same way, as shown in Figure 4.
5. Separate the upper points and fold them down to make the finished cup (Figure 5).



FIGURE 1

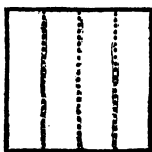


FIGURE 2

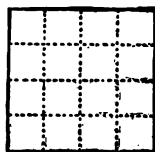


FIGURE 3

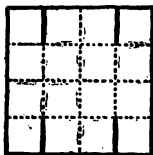


FIGURE 4

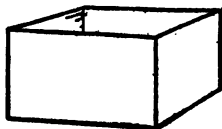


FIGURE 5 (Enlarged)

MAKING A BOX

1. Fold a 10-inch square of paper in the center. Crease and open as shown in Figure 1.
2. Carefully fold the two outside edges to the center. Crease and open as shown in Figure 2.
3. Fold the other two edges to the center in the same way, as shown in Figure 3.
4. Cut along one side of each corner square as shown by the heavy lines in Figure 4.
5. Fold the box into shape as in Figure 5, and paste the corner squares inside.

**OUR COMMON COINS**

Read and learn :

5 cents = 1 nickel

10 cents = 1 dime

100 cents = 1 dollar

25 cents = a quarter of a dollar

50 cents = a half dollar

\$ means dollars ; ¢ means cents.

MONEY TABLE

1 nickel = 5¢	11 nickels = 55¢
2 nickels = 10¢	12 nickels = 60¢
3 nickels = 15¢	13 nickels = 65¢
4 nickels = 20¢	14 nickels = 70¢
5 nickels = 25¢	15 nickels = 75¢
6 nickels = 30¢	16 nickels = 80¢
7 nickels = 35¢	17 nickels = 85¢
8 nickels = 40¢	18 nickels = 90¢
9 nickels = 45¢	19 nickels = 95¢
10 nickels = 50¢	20 nickels = \$1

1 dime = 10¢	6 dimes = 60¢
2 dimes = 20¢	7 dimes = 70¢
3 dimes = 30¢	8 dimes = 80¢
4 dimes = 40¢	9 dimes = 90¢
5 dimes = 50¢	10 dimes = \$1

1 quarter = 25¢	3 quarters = 75¢
2 quarters = 50¢	4 quarters = \$1

READING MONEY

Read:

1. Mary spent 30¢ for her lunch.
2. Ned paid \$2 for a baseball glove.
3. It costs 10¢ to send a letter by special delivery.
4. Tom earned \$5.30 and put it in the savings bank. When he puts in \$4.70 more he will have \$10 in the bank.
5. Frank paid 50¢ for admission to the circus, \$1 to see the side shows, and 25¢ for cold drinks and ice cream. In all he spent \$1.75.
6. Her mother paid \$5.25 for a pair of school shoes for Louise.

7. \$1.25	\$5.00	\$1.65	\$3.50
35¢	75¢	50¢	\$2.15
\$1.00	45¢	\$2.85	98¢

Real or toy money should be used to make the pupils familiar with the coins and their values. The writing of dollars and cents, as \$5.30 in Ex. 4, above, should be sufficiently explained to enable the pupils to read the examples on this page.

IN THE LUNCH ROOM

Milk	5¢	Bread and butter	5¢
Cocoa	5¢	Meat sandwiches	5¢
Lemonade	5¢	Cheese sandwiches	5¢
Soup	10¢	Lettuce sandwiches	5¢
Plate dinner	15¢	Beans and muffins	10¢
Stuffed eggs	10¢	Spinach and muffins	10¢
Salad	5¢	Ice cream	10¢

1. What will your lunch cost if you have milk, a plate dinner, and ice cream?

$$5¢ + 15¢ + 10¢ = ?¢$$

2. What will your lunch cost if you have cocoa, soup, and a meat sandwich?

$$5¢ + 10¢ + 5¢ = ?¢$$

3. What will your lunch cost if you have spinach and muffins, salad, and lemonade?

$$10¢ + 5¢ + 5¢ = ?¢$$

4. Select a lunch that will cost 25¢.

5. Select a lunch that will cost 30¢.

HALVES, THIRDS, AND FOURTHS



Read:

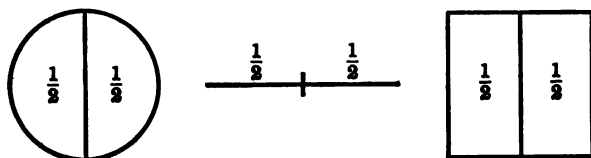
1. This apple has been cut into 2 equal parts.
2. Each part of the apple is called one half.
3. We write one half like this: $\frac{1}{2}$.



4. This apple has been cut into 3 equal parts.
5. Each part of the apple is called one third.
6. We write one third like this: $\frac{1}{3}$.



7. This apple has been cut into 4 equal parts.
8. Each part of the apple is called one fourth.
9. We write one fourth like this: $\frac{1}{4}$.

**ONE HALF**

1. How many halves make a whole circle?
2. How many halves make a whole line?
3. How many halves make a whole square?
4. How many halves make a whole of anything?
5. How many are $\frac{1}{2}$ of 2 things?
6. How many are $\frac{1}{2}$ of 4 things?
7. In a class of 10 children $\frac{1}{2}$ of them are boys. How many boys are there in the class?
8. Read and learn :

$$\frac{1}{2} \text{ of } 2 = 1$$

$$\frac{1}{2} \text{ of } 6 = 3$$

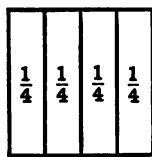
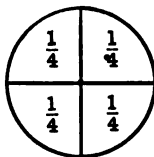
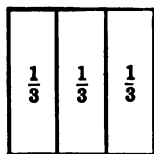
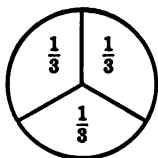
$$\frac{1}{2} \text{ of } 10 = 5$$

$$\frac{1}{2} \text{ of } 4 = 2$$

$$\frac{1}{2} \text{ of } 8 = 4$$

$$\frac{1}{2} \text{ of } 12 = 6$$

The pupils should cut and fold paper, divide a number of books equally among two, three, or four pupils, and so on until they thoroughly understand the meaning of the fractions.



THIRDS AND FOURTHS

1. How many thirds make a whole of anything?

2. How many fourths make a whole of anything?

3. Which is larger, $\frac{1}{3}$ of the circle or $\frac{1}{4}$ of the circle? $\frac{1}{3}$ of the square or $\frac{1}{4}$ of the square?

4. Had you rather have $\frac{1}{3}$ of an apple or $\frac{1}{4}$ of an apple?

5. Had you rather have $\frac{1}{3}$ of 12 oranges or $\frac{1}{4}$ of 12 oranges?

6. Read and learn :

$$\frac{1}{3} \text{ of } 6 = 2$$

$$\frac{1}{3} \text{ of } 9 = 3$$

$$\frac{1}{3} \text{ of } 12 = 4$$

$$\frac{1}{4} \text{ of } 4 = 1$$

$$\frac{1}{4} \text{ of } 8 = 2$$

$$\frac{1}{4} \text{ of } 12 = 3$$

PROBLEMS

1. James's father gave him 10 pennies. James gave his little sister $\frac{1}{2}$ of them. How many pennies did he give her?

$$\frac{1}{2} \text{ of } 10 = ?$$

2. Tom had 8 marbles. One of his friends came to see him, and Tom let him play with $\frac{1}{2}$ of his marbles. How many marbles did he let his friend have?

$$\frac{1}{2} \text{ of } 8 = ?$$

3. Robert had 9 bananas and divided them equally among 3 playmates. How many bananas did he give each child?

$$\frac{1}{3} \text{ of } 9 = ?$$

4. Helen divided 12 paper dolls equally among 4 little girls. How many dolls did each girl have?

$$\frac{1}{4} \text{ of } 12 = ?$$

5. If I divide an apple equally among 3 children, what part of the apple will each have?

$$\frac{1}{3} \text{ of } 1 = ?$$



MAKING A CALENDAR

1. Read :

Thirty days hath September,
 April, June, and November.
 All the rest have thirty-one
 Except February alone,
 To which we twenty-eight assign
 Till leap year gives it twenty-nine.

2. Read and learn :

7 days = 1 week 12 months = 1 year
 4 weeks = 1 month 365 days = 1 year

3. Make a calendar for the present month.

Each morning the teacher should write the month, day, and year on the blackboard.



PINTS, QUARTS, AND GALLONS

Milk is usually sold in pint, quart, or half-gallon bottles.

1. Which bottle is smaller, the pint or the quart bottle?

2. Find by measuring how many pints make a quart; how many quarts make a gallon.

3. Read and learn :

2 pints = 1 quart

4 quarts = 1 gallon

2 pt. = 1 qt.

4 qt. = 1 gal.

Pupils should do actual measuring with the pint, quart, half-gallon, and gallon measures. To stimulate interest they may play that the water is milk, oil, gasoline, or other liquid.

PROBLEMS

1. If a quart of milk costs 10¢, what does a pint of milk cost?

2. If a quart of milk costs 10¢, what does 2 quarts, or $\frac{1}{2}$ gallon, of milk cost?

3. If a quart of oil costs 30¢, what does 2 quarts cost?

4. If a pint of sweet cream costs 25¢, what does 1 quart cost?

5. At our house the milkman leaves 2 quarts of milk in the morning and 2 quarts in the afternoon. How many quarts of milk does he bring each day?

6. If I have a quart of milk and a pint of milk, how many pints of milk do I have?

7. A child should drink at least a quart of milk each day. How much do you drink?

8. Point out a pint measure; a quart measure; a gallon measure.

POUNDS AND OUNCES

We measure our weight in pounds.

Read :

1. Meat is sold by the pound. Can you tell other things that are sold by the pound?

2. Things that weigh less than a pound are often measured in ounces.

3. Read and learn :

16 ounces = 1 pound

16 oz. = 1 lb.

4. This table gives the average height and weight for children from seven to nine years:

AGE	BOYS	GIRLS	BOYS	GIRLS
7	44 in.	44 in.	48 lb.	47 lb.
8	46 in.	46 in.	52 lb.	50 lb.
9	50 in.	49 in.	57 lb.	55 lb.

Compare your height and weight with this table.

CHAPTER V

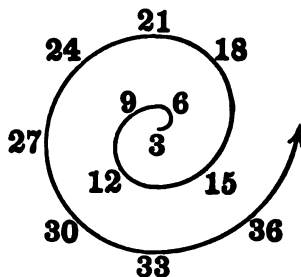
MULTIPLICATION

COUNTING BY THREES AND FOURS

1. Begin at 3 and run around this spiral from 3 to 36.

2. Run around the spiral backward from 36 to 3.

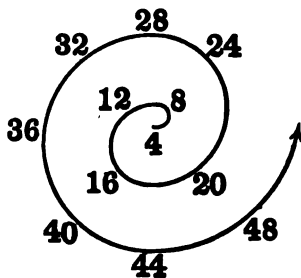
3. Practice until you can count to 36 as easily by 3's as you can by 1's.



4. Run around this spiral from 4 to 48.

5. Practice until you can count by 4's from 4 to 48 without the spiral.

6. Line up and count the children in your room by 2's, then by 3's, and then by 4's.



MULTIPLYING 2

1. Study the columns of 2's shown below:

									2
								2	2
							2	2	2
					2	2	2	2	2
				2	2	2	2	2	2
		2	2	2	2	2	2	2	2
	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2
<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>
2	4	6	8	10	12	14	16	18	20

2. How many 2's do you see in 8? in 12?
in 6? in 14? in 20? in 16? in 18? in 10?

3. How many are 5 twos?

4. How many are 8 twos?

5. How many are 9 twos?

6. Count by 2's from 2 to 24.

PROBLEMS

The sign $\times$ is read "times."

1. Read and learn :

$1 \times 2 = 2$

$5 \times 2 = 10$

$9 \times 2 = 18$

$2 \times 2 = 4$

$6 \times 2 = 12$

$10 \times 2 = 20$

$3 \times 2 = 6$

$7 \times 2 = 14$

$11 \times 2 = 22$

$4 \times 2 = 8$

$8 \times 2 = 16$

$12 \times 2 = 24$

2. There are 4 boys and each of them has 2 marbles. How many marbles are there in all?

$$4 \times 2 \text{ marbles} = ? \text{ marbles}$$

3. There are 3 girls and each girl has 2 dolls. How many dolls are there in all?

$$3 \times 2 \text{ dolls} = ? \text{ dolls}$$

4. Frank's sister is 2 years old. Frank is 2 times as old as his sister. How many years old is Frank?

$$2 \times 2 \text{ years} = ? \text{ years}$$

The pupils should be shown that multiplication saves adding in the case where the numbers added are all equal.

MULTIPLYING 3

1. Study the columns of 3's shown below :

									3
								3	3
							3	3	3
						3	3	3	3
					3	3	3	3	3
			3	3	3	3	3	3	3
		3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3
$\frac{3}{3}$	$\frac{3}{6}$	$\frac{3}{9}$	$\frac{3}{12}$	$\frac{3}{15}$	$\frac{3}{18}$	$\frac{3}{21}$	$\frac{3}{24}$	$\frac{3}{27}$	$\frac{3}{30}$

2. Count by 3's from 3 to 36.

3. How many 3's are there in 6? in 9? in 15? in 21? in 27? in 12? in 24? in 18?

4. How many are 3 threes? 4 threes?

5. How many are 10 threes? 7 threes?

6. How many are 6 threes? 9 threes?

PROBLEMS

1. Read and learn :

$$1 \times 3 = 3$$

$$5 \times 3 = 15$$

$$9 \times 3 = 27$$

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$10 \times 3 = 30$$

$$3 \times 3 = 9$$

$$7 \times 3 = 21$$

$$11 \times 3 = 33$$

$$4 \times 3 = 12$$

$$8 \times 3 = 24$$

$$12 \times 3 = 36$$

2. Louise has 3 storybooks. Her sister May has 3 times as many. How many books has May?

$$3 \times 3 \text{ books} = ? \text{ books}$$

3. Alice takes 3 music lessons each week. How many lessons does Alice have in 4 weeks?

$$4 \times 3 \text{ lessons} = ? \text{ lessons}$$

4. Kate earns 3 pennies for sweeping the walk each morning. How many pennies does she earn in 1 week, or 7 days?

$$7 \times 3 \text{ pennies} = ? \text{ pennies}$$

5. If 1 book cover costs 3¢, how much do 5 covers cost?

$$5 \times 3¢ = ?¢$$

6. How many cents are $6 \times 3¢$?

7. How many dollars are 7×3 dollars?

MULTIPLYING 4

1. Study these columns of 4's. How many are 3 fours?

2. How many are 4 fours?

3. How many are 6 fours?

4. How many are 5 fours?

					4
				4	4
			4	4	4
		4	4	4	4
	4	4	4	4	4
<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>
4	8	12	16	20	24

5. Read:

1 four = 4

5 fours = 20

9 fours = 36

2 fours = 8

6 fours = 24

10 fours = 40

3 fours = 12

7 fours = 28

11 fours = 44

4 fours = 16

8 fours = 32

12 fours = 48

6. How many 4's are there in 8? in 12? in 48? in 32? in 16? in 20? in 24? in 28?

7. Count by 4's from 4 to 48.

Some second-grade courses of study do not include the tables of fours. In such cases, pages 98 and 99 may be omitted.

PROBLEMS

1. Read and learn :

$1 \times 4 = 4$

$5 \times 4 = 20$

$9 \times 4 = 36$

$2 \times 4 = 8$

$6 \times 4 = 24$

$10 \times 4 = 40$

$3 \times 4 = 12$

$7 \times 4 = 28$

$11 \times 4 = 44$

$4 \times 4 = 16$

$8 \times 4 = 32$

$12 \times 4 = 48$

2. An automobile has 4 wheels. How many wheels do 3 automobiles have?

$3 \times 4 \text{ wheels} = ? \text{ wheels}$

3. A horse has 4 feet. How many feet do 4 horses have?

$4 \times 4 \text{ feet} = ? \text{ feet}$

4. A kitty has 4 paws. How many paws do 2 kitties have?

$2 \times 4 \text{ paws} = ? \text{ paws}$

5. A square has 4 sides. How many sides do 6 squares have?

$6 \times 4 \text{ sides} = ? \text{ sides}$

6. How many dollars are 5×4 dollars?

7. How many desks are 8×4 desks?

MULTIPLYING 5

1. In these columns of 5's how many 5's do you see in 15?

2. How many 5's do you see in 25?

3. How many 5's do you see in 20?

4. Count by 5's from 5 to 25.

				5
			5	5
		5	5	5
	5	5	5	5
5	5	5	5	5
<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>

5. Count by 5's from 5 to 50.

6. Read and learn :

$$1 \times 5 = 5$$

$$5 \times 5 = 25$$

$$9 \times 5 = 45$$

$$2 \times 5 = 10$$

$$6 \times 5 = 30$$

$$10 \times 5 = 50$$

$$3 \times 5 = 15$$

$$7 \times 5 = 35$$

$$11 \times 5 = 55$$

$$4 \times 5 = 20$$

$$8 \times 5 = 40$$

$$12 \times 5 = 60$$

7. There are 5 school days in a week. How many days do you go to school in 1 week? in 2 weeks? in 3 weeks? in 4 weeks?

8. If an ice-cream cone costs 5¢, how much do you pay for 7 cones? 9 cones? 10 cones?

TABLES FOR GRADE II

LENGTH

12 inches = 1 foot

3 feet = 1 yard

LIQUID

2 pints = 1 quart

4 quarts = 1 gallon

WEIGHT

16 ounces = 1 pound

MONEY

5 cents = 1 nickel

10 dimes = 1 dollar

10 cents = 1 dime

100 cents = 1 dollar

TIME

60 minutes = 1 hour

4 weeks = 1 month

24 hours = 1 day

12 months = 1 year

7 days = 1 week

365 days = 1 year

ADDITION TABLE

$0 + 2 = 2$	$0 + 3 = 3$	$0 + 4 = 4$	$0 + 5 = 5$
$1 + 2 = 3$	$1 + 3 = 4$	$1 + 4 = 5$	$1 + 5 = 6$
$2 + 2 = 4$	$2 + 3 = 5$	$2 + 4 = 6$	$2 + 5 = 7$
$3 + 2 = 5$	$3 + 3 = 6$	$3 + 4 = 7$	$3 + 5 = 8$
$4 + 2 = 6$	$4 + 3 = 7$	$4 + 4 = 8$	$4 + 5 = 9$
$5 + 2 = 7$	$5 + 3 = 8$	$5 + 4 = 9$	$5 + 5 = 10$
$6 + 2 = 8$	$6 + 3 = 9$	$6 + 4 = 10$	$6 + 5 = 11$
$7 + 2 = 9$	$7 + 3 = 10$	$7 + 4 = 11$	$7 + 5 = 12$
$8 + 2 = 10$	$8 + 3 = 11$	$8 + 4 = 12$	$8 + 5 = 13$
$9 + 2 = 11$	$9 + 3 = 12$	$9 + 4 = 13$	$9 + 5 = 14$
$10 + 2 = 12$	$10 + 3 = 13$	$10 + 4 = 14$	$10 + 5 = 15$
$0 + 6 = 6$	$0 + 7 = 7$	$0 + 8 = 8$	$0 + 9 = 9$
$1 + 6 = 7$	$1 + 7 = 8$	$1 + 8 = 9$	$1 + 9 = 10$
$2 + 6 = 8$	$2 + 7 = 9$	$2 + 8 = 10$	$2 + 9 = 11$
$3 + 6 = 9$	$3 + 7 = 10$	$3 + 8 = 11$	$3 + 9 = 12$
$4 + 6 = 10$	$4 + 7 = 11$	$4 + 8 = 12$	$4 + 9 = 13$
$5 + 6 = 11$	$5 + 7 = 12$	$5 + 8 = 13$	$5 + 9 = 14$
$6 + 6 = 12$	$6 + 7 = 13$	$6 + 8 = 14$	$6 + 9 = 15$
$7 + 6 = 13$	$7 + 7 = 14$	$7 + 8 = 15$	$7 + 9 = 16$
$8 + 6 = 14$	$8 + 7 = 15$	$8 + 8 = 16$	$8 + 9 = 17$
$9 + 6 = 15$	$9 + 7 = 16$	$9 + 8 = 17$	$9 + 9 = 18$
$10 + 6 = 16$	$10 + 7 = 17$	$10 + 8 = 18$	$10 + 9 = 19$

SUBTRACTION TABLE

2-2=0	3-3=0	4-4=0	5-5=0
3-2=1	4-3=1	5-4=1	6-5=1
4-2=2	5-3=2	6-4=2	7-5=2
5-2=3	6-3=3	7-4=3	8-5=3
6-2=4	7-3=4	8-4=4	9-5=4
7-2=5	8-3=5	9-4=5	10-5=5
8-2=6	9-3=6	10-4=6	11-5=6
9-2=7	10-3=7	11-4=7	12-5=7
10-2=8	11-3=8	12-4=8	13-5=8
11-2=9	12-3=9	13-4=9	14-5=9
12-2=10	13-3=10	14-4=10	15-5=10
6-6=0	7-7=0	8-8=0	9-9=0
7-6=1	8-7=1	9-8=1	10-9=1
8-6=2	9-7=2	10-8=2	11-9=2
9-6=3	10-7=3	11-8=3	12-9=3
10-6=4	11-7=4	12-8=4	13-9=4
11-6=5	12-7=5	13-8=5	14-9=5
12-6=6	13-7=6	14-8=6	15-9=6
13-6=7	14-7=7	15-8=7	16-9=7
14-6=8	15-7=8	16-8=8	17-9=8
15-6=9	16-7=9	17-8=9	18-9=9
16-6=10	17-7=10	18-8=10	19-9=10

MULTIPLICATION TABLE

$1 \times 2 = 2$	$1 \times 3 = 3$
$2 \times 2 = 4$	$2 \times 3 = 6$
$3 \times 2 = 6$	$3 \times 3 = 9$
$4 \times 2 = 8$	$4 \times 3 = 12$
$5 \times 2 = 10$	$5 \times 3 = 15$
$6 \times 2 = 12$	$6 \times 3 = 18$
$7 \times 2 = 14$	$7 \times 3 = 21$
$8 \times 2 = 16$	$8 \times 3 = 24$
$9 \times 2 = 18$	$9 \times 3 = 27$
$10 \times 2 = 20$	$10 \times 3 = 30$
$11 \times 2 = 22$	$11 \times 3 = 33$
$12 \times 2 = 24$	$12 \times 3 = 36$
$1 \times 4 = 4$	$1 \times 5 = 5$
$2 \times 4 = 8$	$2 \times 5 = 10$
$3 \times 4 = 12$	$3 \times 5 = 15$
$4 \times 4 = 16$	$4 \times 5 = 20$
$5 \times 4 = 20$	$5 \times 5 = 25$
$6 \times 4 = 24$	$6 \times 5 = 30$
$7 \times 4 = 28$	$7 \times 5 = 35$
$8 \times 4 = 32$	$8 \times 5 = 40$
$9 \times 4 = 36$	$9 \times 5 = 45$
$10 \times 4 = 40$	$10 \times 5 = 50$
$11 \times 4 = 44$	$11 \times 5 = 55$
$12 \times 4 = 48$	$12 \times 5 = 60$

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